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Offices: 7, Adam Street, Adelphi, W.C.2.

Telegrams: Lancet, Rand, London. Telephone: Temple Bar 7228 and 7229.

No. XIII., of Vol. I., 1939. LONDON, SATURDAY, APRIL 1, 1939. Pp. 128—Price 1s.
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No. 6031 LONDON: SATURDAY, APRIL 1, 1939 CCXXXVI

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

The Aerial Spread of Streptococcal Infections. By R. CRUICKSHANK, M.D., and G. E. GODBER, M.R.C.P. 741

A Rare Feature of the Ramsay Hunt Syndrome. By C. P. G. WAKELEY, F.R.C.S., and J. H. MULVANY, F.R.C.S. (*illus.*) 746

The Shipway Machine and Closed-circuit Anæsthesia. By F. B. MALLINSON, M.R.C.S. (*illus.*) ... 750

Postoperative Thrombosis and Embolism: Ephedrine and Atropine as a Prophylactic. By Prof. R. PILCHER, F.R.C.S. ... 752

Pneumococcal Meningitis Treated with M. & B. 693. By D. MCALPINE, F.R.C.P., and G. C. THOMAS, M.D. 754

Staphylococcal Septicæmia Treated with M. & B. 693. By H. J. WADE, M.R.C.P. (*with chart*) 756

CLINICAL AND LABORATORY NOTES

A Simple Method of Applying Extension to the Elbow. By T. A. BUTCHER, M.D. (*illus.*).. 757

Acute Trans-diaphragmatic Prolapse of Viscera. By J. A. MAXWELL CAMERON, F.R.C.S.E. (*illus.*) 757

MEDICAL SOCIETIES

Royal Society of Medicine: Section of Epidemiology: Jaundice 759

Section of Disease in Children: Familial Hepatitis and Chronic Jaundice 760

Medical Society of London: Ocular Manifestations of General Disease 761

THE LANCET 100 Years Ago 758

REVIEWS AND NOTICES OF BOOKS

Medical Organisation and Surgical Practice in Air Raids. By P. H. Mitchiner, F.R.C.S., and E. M. Cowell, F.R.C.S.. 763

Histological Technique for Intracranial Tumours. By Dorothy S. Russell, M.D. 763

A Synopsis of Hygiene. By Sir Wilson Jameson, F.R.C.P., and Lt.-Col. G. S. Parkinson, M.R.C.S. 764

British Journal of Children's Diseases 764

Journal of Social Ophthalmology 764

LEADING ARTICLES

JOURNALS OR MICROFILMS? 765

DIPHTHERIA 766

MEDICAL ASPECTS OF AVIATION 767

ANNOTATIONS

Stored Blood 768

Psychiatric Aspects of Crime 768

School Meals and Milk ... 769

Surgical Relief in Oxycephaly 769

Typhoid Antigens 770

Intravenous Injection of Ascitic Fluid 770

Premature Separation of the Placenta 770

Irradiation of Zoster 771

Horse-serum Neuritis 771

Polycythæmia 771

A Surgeon's Autobiography 771

The Future of the Voluntary Hospitals 772

Prostatic Resection in Elderly Patients 772

PUBLIC HEALTH

First-aid Posts and Ambulances (A.R.P.)—Part-time Medical Work for the L.C.C.—Typhoid at Nottingham—Billeting of Refugees in Villages .. 788

Infectious Disease in England and Wales 802

SPECIAL ARTICLES

The Barcelona Blood-transfusion Service. By F. DURAN JORDA, M.D... 773

A State Medical Service: Debate by Fellowship of Medicine 776

Medicine and the Law: Damages for Contracting Undulant Fever..... 777

Australia: Scientists at Canberra—National Insurance Abandoned .. 777

Paris: Arrangements for Visiting Doctors 778

Ireland: A Hospitals Bill—Census Report 779

LETTERS TO THE EDITOR

Mental Nursing (Dr. A. M. Spencer) 782

Abridged Life Tables (Mr. B. Benjamin, F.S.S.) ... 782

Cardiazol Convulsion Therapy (Drs. H. Hoff and J. A. Shaby) 782

Colour of Venous Blood in Rheumatism (Dr. V. Hetherington) 783

Sale of Patent Medicines (Mr. F. C. Goodall, Ph.C.) 783

Inquiries about Hospital Patients 783

PANEL AND CONTRACT PRACTICE

Not Temporary Residents—The Practitioners' Fund—Costly Medicines 789

OBITUARY

John Samuel Risien Russell, F.R.C.P. (*with portrait*).. 790

Robert McMillan Bowman, M.B. 790

William Isaac Cumberlidge, F.R.C.S. 791

Ian Mount Grant, M.D.... 791

Roy Samuel Dobbin, F.R.C.P. 791

Elkin Percy Cumberbatch, F.R.C.P. (*with portrait*). 792

Prof. Samuel Hybbinette.. 792

Clement Treves Neve, F.R.C.S. 793

Harry Bacon Wilkinson, M.R.C.S. 793

The late Mr. Leonard Joyce 793

The late Sir Henry Lunn.. 794

GRAINS AND SCRUPLES

From An Onlooker—I.... 780

PARLIAMENT

On the Floor of the House 784

From the Press Gallery: Safety in Mines—Maternity Services in Dumfriesshire and Galloway.. 785

Question Time: Water-supply and Sewerage and Civil Defence—Army Recruits and Dental Treatment 787

MEDICAL NEWS

University of London 794

University of Dublin 794

Society of Apothecaries ... 794

Guy's Hospital 794

University of Sheffield 795

University of Leeds 795

University of Liverpool ... 795

Royal College of Obstetricians and Gynæcologists 795

Royal Free Hospital 795

Food Education Society .. 795

Microchemical Club 795

Functions of Hospitals in War-time 795

National Fitness Council for England and Wales 795

Association of Industrial Medical Officers 795

Spanish Refugees in France 796

Emergency Bed Services ..796

A Blood-Bank at Manchester 796

The Tuberculosis Service in War-time 796

Lectures in Hospital Administration 772

NOTES, COMMENTS AND ABSTRACTS

Good Quality in Medical Care. By J. ROSSLYN EARP, M.R.C.S. 798

Street Accidents 798

Tuberculous Peritonitis ... 799

Treatment of Fractures in Cairo 799

Fulmars and Psittacosis... 799

True Cysts of the Pancreas 800

Constructive Health Book. 800

Mental Treatment in Ireland 800

Filarial Blinding in East and Central Africa..... 801

Psychological Factors in Rheumatic Disorders ... 802

Subjective Experience of a Cerebral Tumour 802

Appointments—Vacancies. 796

Medical Diary 797

Births, Marriages, Deaths. 797

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By

JAMES MAXWELL, M.D. (Lond.), F.R.C.P. (Lond.)

Assistant Physician and Demonstrator of Practical Medicine, St. Bartholomew's Hospital; Physician, Royal Chest Hospital; Consulting Physician, Royal National Sanatorium, Bournemouth

CONTENTS

SECTION I
THE HISTORY

CHAP.
1. THE SIX MAJOR SYMPTOMS
2. THE SIX MAJOR SYMPTOMS (*contd.*)
3. MINOR SYMPTOMS
4. THE AUXILIARY HISTORY

SECTION II
PHYSICAL EXAMINATION OF THE CHEST

5. INSPECTION
6. PALPATION
7. PERCUSSION
8. AUSCULTATION

SECTION III
SPECIAL INVESTIGATIONS

9. THE SPUTUM
10. BLOOD EXAMINATIONS—PLEURAL FLUID
11. RADIOLOGY OF THE CHEST
12. SPECIAL DIAGNOSTIC METHODS

SECTION IV
DISEASES OF THE RESPIRATORY TRACT

13. THE NOSE
14. THE MOUTH
15. THE LARYNX
16. THE TRACHEA AND BRONCHI

SECTION IV
(*continued*)

CHAP.
17. ASTHMA
18. BRONCHIECTASIS
19. TUMOURS OF THE BRONCHI
20. CHEST INJURIES — DISORDERS OF THE PULMONARY CIRCULATION
21. EMPHYSEMA
22. COLLAPSE OF THE LUNG
23. PNEUMONIA
24. BRONCHO-PNEUMONIA
25. PNEUMONITIS
26. LUNG ABSCESS
27. PULMONARY TUBERCULOSIS
28. PULMONARY TUBERCULOSIS (*contd.*)
29. TREATMENT OF PULMONARY TUBERCULOSIS
30. NON-TUBERCULOUS CHRONIC LUNG INFECTIONS
31. FIBROSIS OF THE LUNG
32. THE PLEURA
33. "PLEURISY"
34. EMPYEMA
35. TUMOURS OF THE PLEURA
36. THE MEDIASTINUM
37. THE DIAPHRAGM

INDEX

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ADDRESSES AND ORIGINAL ARTICLES

THE AERIAL SPREAD OF STREPTOCOCCAL INFECTIONS

BY R. CRUICKSHANK, M.D. Aberd., D.P.H.

AND

G. E. GODBER, B.M. Oxfd, M.R.C.P., D.P.H.

(*From the London County Council Group Laboratory and North-Western Hospital, Hampstead, London*)

MEDICAL opinion on the mode of spread of infectious diseases has changed considerably since the beginning of the present century. In particular, the recognition of the human carrier as a reservoir of infection has helped to explain many anomalies and to dispel old notions about the dangers of miasmas, sewer-gases, and the like. As regards the diseases in which the causal organism has its entry and exit by the respiratory tract, belief in a widespread aerial transmission of the *materies morbi*, of which Power (1880–81) from his smallpox studies at the Fulham Hospital was such a strong advocate, has given place to something requiring much more intimate contact between the infective person, whether clinical case or carrier, and the susceptible individual. The studies of Flügge (1897, 1899) and his pupils[1] were in great part responsible for this volte-face; these workers, although they confirmed the fact that micro-organisms were transported considerable distances in dust by fine air-currents and proved that bacteria artificially introduced into the mouth could be recovered four to nine metres from the individual after coughing or sneezing, failed in experiments with infective tuberculous patients to demonstrate the pathogens in any numbers at a distance of more than one metre from the coughing patient. The additional finding that guineapigs could be infected by direct exposure to a tuberculous patient but much less easily by inhaling dried sputum gave further support to Flügge's opinion that infections of the respiratory tract were principally spread by what he called the "spray" or "droplet" method.

This doctrine was gradually put to the test of practical experience. Medical superintendents who, following the French pioneers, had proved the effectiveness of cell or cubicle for preventing the spread of most infections now began to try other less tangible (and less expensive) methods of controlling cross-infection, particularly in fever hospitals. About 1908 Biernacki at the Plaistow Hospital introduced "barrier" nursing, which means the isolation of a patient in a ward by a visible (screens) or invisible barrier, involving precautionary measures by a trained nursing staff to prevent the spreading or carrying of infective material from the isolated patient to his neighbours. Crookshank (1910) at the Barnes Hospital, Mortlake, was the first to practise a modified system of "bed-isolation," a system which was considerably, and independently, extended and popularised by Rundle and his assistants at the Fazakerley Hospital, Liverpool. Bed-isolation is simply the application of barrier nursing with or without screens to every patient in the ward, so that a variety of infectious diseases may be nursed side by side with little risk of cross-infection. In their original experiment Rundle and Burton[2] (1912) placed in two small wards, each containing 12–13 beds, cases of puerperal fever, erysipelas, pertussis, chickenpox, rubella, doubtful scarlet fever and diphtheria, and convalescent measles, and during a period of two years with a turnover of 473 patients there were only two secondary cases of scarlet fever. Despite the fact, now generally admitted, that patients in the early stage of measles or chickenpox cannot be nursed in barrier or bed-isolation wards without the risk of secondary cases, the success of these methods was, and still is, a strong argument in favour of the limited droplet spread of infections of the respiratory tract. This view was fully endorsed by Chapin (1910, 1912), who marshalled all the arguments in favour of contact and droplet infection and against the aerial spread of pathogens, whether of respiratory or intestinal origin. On the surgical side, too, there has been a gradual change from Lister's carbolic sprays to prevent contamination from the air through a more localised antiseptic technique to the present "aseptic" methods, indicating an absence of fear of wound-infection from aerial sources.

Previous Evidence of Air-borne Infection

Interest in the possibility of the aerial spread of pathogenic bacteria was apparently reawakened after one of us (Cruickshank 1935) showed that most third-degree burns became infected with the hæmolytic streptococcus after admission of the patient to hospital, and that both the dust and the air of the ward contained numerous hæmolytic streptococci and were thus a possible means of conveying infection from patient to patient. This possibility was made the more probable when Dr. V. D. Allison, to whom cultures were sent for typing, found that strains isolated from eight patients in one ward over a period of three weeks were all of one serological type (type 4), and in another instance a culture recovered from the air of the ward belonged to the same rather rare type (type 23) as a strain isolated from the infected burn of a man in the ward at the time.

The finding of living pathogens in dust, particularly if protected from sunlight, is no new thing; Washbourn and Eyre in 1902 recovered the rather delicate pneumococcus from the dust of ward and laboratory, and even Chapin admitted that the germs of typhoid, dysentery, diphtheria, tuberculosis, and suppuration could, if their resistance to drying were a guide, be spread by dust. Apart from viability, we know of no direct evidence that the virulence of bacteria is, as is sometimes stated, diminished by drying in the air or dust; drying *in vacuo* is now the most reliable method for maintaining both viability and virulence. Recently L. Colebrook (see White 1936) has shown that hæmolytic streptococci will remain viable in dust for at least 10 weeks and their mouse-virulence persist undiminished for 25 days. That these dust-borne organisms may be derived from infective discharges as well as from the respiratory tract was confirmed by White (1936), who found hæmolytic streptococci in varying numbers in the dust of single rooms where patients with streptococcal puerperal infection were being nursed; the streptococcus isolated from the dust was usually of the same serological type as the patient's strain. She quoted an

1. Winslow and Robinson (1910) give a useful summary, and many corroborative experiments, of the early work on aerial and droplet spread of bacteria.

2. This publication was followed by a lively and enlightening discussion in the correspondence columns of THE LANCET, in which Biernacki, Crookshank, Thomson, and Burton were engaged.

instance of infection borne by dust or air: a person contracted a streptococcal pharyngitis after sweeping out the room vacated five days previously by a puerperal patient with whom she had had no direct contact; the two infecting strains were identical in type.

In the following year Brown and Allison (1937) reported an investigation on the isolation of hæmolytic streptococci from the air of scarlet-fever wards. Their results proved that streptococci of the types commonly associated with scarlet fever were plentiful in the air of these wards, and, where throat swabs from the patients were simultaneously examined, the strains isolated from the two sources (patients and air) were very similar both in serological type and in the relative proportions of the various types. They found, as White and we have done, that disturbance of the air by dusting and sweeping increases considerably the number of organisms recoverable from the air by the method commonly used—namely, the exposure of blood-agar plates for a limited period two or three feet from the ground. Such a finding does not necessarily mean that the air is free from pathogens when none are found on the exposed plates (vide infra) but shows that some of the infected dust particles after being disturbed and circulated in the air by dusting or sweeping settle on the exposed plates.

In the light of these recent bacteriological findings much of the earlier epidemiological work—e.g., the data given by Dudley (1926)—could be explained as well on the basis of the aerial spread of pathogens as on a combination of droplet infection and carriers. It may be mentioned in passing that, on the surgical side, the recent investigations of Hart (1937) and Cowan (1938) have attested to the risk of air-borne infection in the theatre during the performance of protracted operations, such as modern surgery of the chest or of the brain involves.

Although Flügge's views on the limited spread of infective material from the respiratory tract have been generally accepted, the epidemiologist has usually found some difficulty in explaining on this view the almost inevitable spread of measles and chickenpox in a ward of susceptible children after the introduction of a case in the early stage of the disease. Thomson (1916), after two and a half years' experience with a barrier ward, concluded that these infections must be air-borne, and there is some recent support for his belief in Colvin's (1932) experiments with another virus, bacteriophage, which after being atomised could be recovered some 53 metres distant. Harries (1935), on the other hand, is inclined to the view that these infections are spread by the contaminated hands of the attendants, and he has adduced much evidence in favour of the manual transference of infections generally.

The work of Wells and his associates (see Wells and Wells 1936), begun in Boston and now being continued in a special unit at the University of Pennsylvania, Philadelphia, has shown that the aerial spread of bacteria and viruses is at least a theoretical possibility. Wells's view, based on much experimental work, is that all droplets expelled from the respiratory tract by coughing or sneezing do not necessarily fall to the ground like rain within a few feet of the individual. The droplets become smaller by evaporation, the ratio of surface to weight increases as the size diminishes, and the particles fall more and more slowly. Wells estimated that droplets of 0·1 mm. diameter will, by the time they drop the height of a man, become so small that they remain suspended in the air like particles of smoke. Droplets which do settle may by evaporation become so small as to be lifted into the air again. The rôle of these "droplet nuclei" in spreading infection will depend largely on the viability and concentration of the organisms they contain. Using a special chamber in which suspensions of bacteria could be atomised, Wells found that certain organisms present in the respiratory tract—e.g., pneumococcus type I, hæmolytic streptococcus, and *Streptococcus viridans*—remained viable for two days (*B. influenzæ* was very short-lived), whereas intestinal bacteria (*B. coli*, *B. typhosus*, *B. paratyphosus* A, and *B. dysenteriæ* Y) did not survive eight hours. Since these droplet nuclei do not tend to settle like larger droplets or dust particles, exposed plates of culture media do not give an accurate count of their numbers in the atmosphere, and Wells (1933) therefore devised an air centrifuge for this purpose. He suggested that *Str. viridans*, an organism ordinarily present in the upper respiratory tract, might be used as an index of air pollution, as *B. coli* is used for water. This is not entirely a new idea, for, apart from Pasteur's classical experiments, Gordon (1902–03) made a similar suggestion and showed that mouth bacteria could be recovered from the air in any part of a room in which people were talking; he made a simple type of air-suction apparatus for estimating the degree of bacterial air-pollution. Wells's experiments have demonstrated how the aerial suspension of bacteria comes about, and his work has obviously an important bearing on the problem of the spread of infectious diseases.

Present Evidence of Air-borne Infection

Our own studies were begun in the winter of 1936 and consist mainly of combined clinical, bacteriological, and epidemiological investigations into (1) two small outbreaks of puerperal sepsis and (2) streptococcal infections in wards of children admitted with diphtheria. An example of each will be given in some detail and brief reference made to some of the others. The serological typing of hæmolytic streptococci (see Griffith 1934, Neisser 1939) isolated from clinical case, carrier, air, or dust has been an integral part of the work, since only thus could we hope to trace the source and mode of spread of the infecting or "epidemic" streptococcus, for the mere discovery of a hæmolytic streptococcus does not help either to incriminate or to exculpate the source unless the group and serological type are known. During the past two years other outbreaks have been studied in which the evidence did not suggest an aerial spread.

AIR-BORNE PUERPERAL INFECTION

The outbreak to be described occurred in the maternity ward of a general hospital and concerns six patients, three of whom developed local uterine sepsis and three others became streptococcus cervical carriers or at most suffered from very mild genital-tract infections. The first patient discovered to have a puerperal infection with the hæmolytic streptococcus was A. B., who was admitted and delivered on Aug. 21; her temperature, which was raised on admission, did not settle, and on Aug. 23 culture of a cervical swab gave a practically pure growth of type 25 *Str. pyogenes*. [The name *Str. pyogenes* is reserved for hæmolytic streptococci belonging to group A (Lancefield).] On the same day the patient was isolated in a separate ward and transferred next day to an isolation hospital. Since none of the attendants of this patient was found to be carrying hæmolytic streptococci in the nose or throat, and since she was febrile on admission with membranes ruptured, it is possible that the infecting organism was introduced to the unit by her. It is important

to note that she lay in the main maternity ward for 36 hours after delivery. The next two patients to be infected were C. D. and E. F., admitted to the maternity ward on Aug. 18 and 22 and delivered in different labour wards and by different nurses on Aug. 23 and 24 respectively. These patients became febrile—and were isolated—on the 25th, and cervical swabs on that date gave practically pure cultures of type 25 *Str. pyogenes*. They were transferred to the isolation hospital next day. C. D. and three other patients with raised temperatures had been moved into a small four-bedded ward on the 25th. Vaginal swabs of the latter three patients, taken on that day, were negative, but two days later in a general reswabbing hæmolytic streptococci (type 25) were recovered from two of them, neither of whom showed any clinical signs of infection. A patient in the main ward was similarly found to be a vaginal carrier of the epidemic type. These three patients, although afebrile and therefore not notified, continued to carry hæmolytic streptococci in the genital tract during their stay in hospital. They were, of course, kept in isolation.

As the same serological type of hæmolytic streptococcus was present in all cases, obviously the infecting organism must have been carried by some means from patient to patient. The more obvious routes by which such infection may spread are (1) by human throat or nose carrier, (2) by infected instruments or gloves during the ritual of nursing, and (3) by the dust and atmosphere of the ward.

(1) The noses and throats of the nursing staff of the main maternity ward were swabbed on Aug. 24, the medical staff on the 25th, and the nurses in the small ward on the 25th and 31st. None of the medical and nursing staff who attended the infected patients was found to be carrying group A (Lancefield) hæmolytic streptococcus; there was no common attendant responsible for the confinements of these cases.

(2) The transference of infection by the hands (gloved or ungloved) of attendant nurses or by instruments or bedpans has probably often played its part in the spread of puerperal infection, but the aseptic and antiseptic precautions taken by the doctor, sister, and staff of the maternity unit make such a method of spread practically impossible in this outbreak. Besides, the originally infected patient was removed from the ward before the others were confined, and infection rarely occurs before confinement.

(3) As regards air-borne infection, blood-agar plates were exposed in the two labour wards on Aug. 26 with negative results. Plates were not exposed in the large and small maternity wards until Sept. 1, by which time the main ward had been disinfected. The plates from that ward were negative, but hæmolytic streptococci of the epidemic type were present on the plates exposed in the small ward. It will be remembered that the patient C. D. was removed from this ward on Aug. 26, and that the cervical swabs of two other contact cases were negative on the 25th and positive on the 27th; hence the latter two cases may have "picked up" the infecting streptococcus on the day *after* C. D. was removed—i.e., they probably became infected not by direct transference from another patient but from the dust or atmosphere of the ward. The evidence in favour of this mode of spread is even stronger in the case of the patients in the main ward, who, although in contact with A. B., the original case, for periods of a few hours to two days before their delivery, almost certainly became infected in the main ward after confinement. If so, there was no chance of direct transference of the infecting organism, since A. B. was removed from the ward before any of the other infected women were delivered, and presumably, therefore, infection was derived from an atmosphere already contaminated with hæmolytic streptococci through the presence in the ward for two days of the originally infected patient. The genital tract immediately after delivery presents a large abraded surface which, as has been shown in burns, is particularly susceptible to attack by the hæmolytic streptococcus. Infection from the atmosphere may be direct, or the organism may lodge in the anterior nares after inhalation and be transferred to the genital tract by the patient's fingers.

The points of special epidemiological interest in this small outbreak are (*a*) serological typing of the hæmolytic streptococci showed that all the patients were infected by one epidemic strain which was not discovered in the upper respiratory tract of any of the attendants on these patients; (*b*) the air and dust of the wards in which the patients lay was probably the means by which the infecting organism was spread; and (*c*) a number of patients were vaginal carriers of the hæmolytic streptococcus during the puerperium without showing any evidence of clinical infection, which justifies a bacteriological examination of the genital tract of all patient-contacts in any institutional outbreak of puerperal sepsis.

Another small epidemic in which the evidence pointed to the air or dust as the vehicle of infection occurred in a well-administered maternity home with a resident medical officer. The outbreak, which included three cases of puerperal infection and three of tonsillitis, was originated by nurse A, who after a sore throat was allowed back on duty on the strength of one negative throat swab. A fortnight later she delivered Mrs. X, who became febrile two days after confinement and was transferred to an isolation hospital with a streptococcal uterine sepsis.

Within ten days of her removal two more cases of puerperal infection occurred in two different wards. (The wards in this home each contained four to six beds.) These two patients were delivered in separate labour rooms, and neither of them was attended at confinement or at any time in the puerperium by nurse A, who like the rest of the staff always wore a mask when on duty.

Although nurse A was suspected of being the source of the first case she continued doing certain ward duties, because several throat swabs had been reported negative. However, when reswabbed by one of us, she was found to be a streptococcal carrier and was taken off duty. Four days later the matron and linen-maid developed streptococcal tonsillitis.

All the strains of hæmolytic streptococcus isolated from these cases belonged to one serological type (type 25). The whole nursing staff was swabbed after the first case of puerperal infection and again on the day that the two cases of tonsillitis occurred; no carrier of the epidemic streptococcus—other than nurse A—was discovered. Blood-agar plates, exposed in the labour rooms and various wards after they had been disinfected, did not detect any hæmolytic streptococci in the atmosphere.

If these observations are pieced together, it may be claimed that, apart from the first case, the infecting organism could not have been transferred directly from carrier to patient or from patient to patient. The nursing technique was of a high standard, and every precautionary measure was being taken to prevent the spread of infection by mediate means. Further, the occurrence of two clinical cases of infection some days after the only carrier of the epidemic streptococcus was taken off duty pointed to some other reservoir for the infecting organism; that this was probably the infected dust or air of the wards is supported by the fact that these were infections of the upper respiratory tract. Direct evidence of an aerial source could not be obtained because the wards were disinfected before the atmosphere was bacteriologically examined.

STREPTOCOCCAL INFECTION IN A DIPHTHERIA WARD

The ward had been open for three months for the accommodation of mild or moderately severe cases of diphtheria, mostly in young children. During this period none of the patients had had otitis media or any other streptococcal complication. Chickenpox was introduced, and the ward was in quarantine up to Dec. 16. It was then rapidly filled.

On the 18th a child was admitted to a corner bed with a condition clinically quinsy and subsequently proved not to be diphtheria; *Str. pyogenes* type 12 was isolated in culture from his throat. Within the next ten days three children in nearby beds developed otorrhœa, and from each of them *Str. pyogenes* type 12 was recovered. Another child had tonsillitis, but cultures were not taken.

After this brief outbreak admissions to the ward ceased because of a fresh case of chickenpox, which was removed to a cubicle and returned to the ward on Jan. 14. This was a signal for a new and more extensive wave of infection. The child on readmission had a raised temperature and was noted to be developing tonsillitis. He had a severe attack with marked adenitis, and *Str. pyogenes* type 6 was isolated from his throat.

During the next week two patients developed otorrhœa and one tonsillitis, and from each case the same serological type of streptococcus (type 6) was obtained. One of the cases of otorrhœa was the boy who had originally introduced the type 12 infection, and he went on to a severe mastoiditis.

At this point swabs were taken from nose and throat of each child in the ward. Of seventeen patients, thirteen had hæmolytic streptococci in nose, throat, or both, and in eight of them the nose culture was positive. It may have been mere coincidence that the four negative cases were the only four Dick-negative children. Nose and throat swabs of the nursing staff of the ward yielded only one scanty positive throat culture (3 colonies) which could not be typed.

At the same time blood-agar plates were exposed in two batches of four—the first batch from 8 P.M. to 7 A.M. and the second from 7 to 9 A.M. The plates were placed on lockers 9 in. above the bed heads and out of the patients' reach. The batch exposed from 8 P.M. to 7 A.M. grew 23 colonies of hæmolytic streptococcus, and those exposed from 7 to 9 A.M. grew 49. Thus there were twice as many colonies on the plates exposed for two hours in the morning during the sweeping and dusting as there were during eleven hours throughout the night; two-thirds of the colonies were on the four plates at the end of the ward where most of the infection had occurred. Random subcultures from these plates, when examined serologically, were all type 6.

Quarantine for chickenpox ended on Jan. 21, and there was an influx of new patients. One of these had a recent otorrhœa, which was shown to be due to *Str. pyogenes* type 28, and during the ensuing week another child had otorrhœa due to type 28. New patients continued to be admitted to the ward, and among them after admission there occurred four cases of tonsillitis, three of otorrhœa, and one of vaginitis; all were streptococcal infections. In three the infecting streptococcus was type 6 and in two type 12; the others were not typed. The child with vaginitis had type 6 in throat and vagina but no clinical signs in the throat.

On Feb. 10 plates were again exposed in the ward and nose and throat swabs were taken as before. Of fifteen patients, only two were negative, twelve had hæmolytic streptococci in the faucial and eight in the nasal swab. On the eight plates exposed 224 colonies of hæmolytic streptococcus were found, 90 being on one plate. Random pickings gave cultures of *Str. pyogenes* type 12. For comparison, eight plates were exposed in a whooping-cough ward under similar conditions, and no hæmolytic streptococci were grown; nose and throat swabs in this ward yielded one doubtful positive.

After Feb. 25 no new patients were admitted, and the numbers were reduced by discharges; but one patient developed tonsillitis, one otorrhœa, and two others otitis media without discharge; in each case type 6 was the infecting streptococcus. Finally, the child who six weeks earlier had a vaginitis due to *Str. pyogenes* type 6 developed scarlet fever, and again cultures from her throat yielded type 6. The ward was closed at the end of March.

This outbreak of streptococcal infection shows two epidemic waves coinciding with the introduction of the two infecting streptococcal types by patients with faucial infection. The first with type 12 was brief and quickly died down, possibly because the ward was in quarantine and its population unchanged. On the introduction of the second infecting type there was another wave, principally affecting those who had escaped the first attack. Afterwards newly admitted patients sustained the bulk of the infection, a state of affairs very similar to experimental epidemic infections in mice, in which the epidemic is maintained by the regular addition of susceptible animals.

Direct droplet infection from patient to patient may be ruled out, since all the children were in bed and the beds were adequately spaced. Similarly, droplet spread from nurse to patient could not occur as none of the staff was a carrier of the epidemic types. Manual transference by nurses or spread by fomites cannot be altogether excluded (there was a communal toy-box), but there was no routine case-to-case hygiene of the nose and swabbing of ears was confined to those children with otorrhœa. It should be remembered that these are infections of the respiratory tract—even in the ear infections the organism presumably gains entrance by this route—and of the two possibilities infected air is surely a more likely source than toys or the contaminated hands of nursing staff. Incidentally, the healthy skin is definitely bactericidal.

An aerial source is suggested by the fact that hæmolytic streptococci belonging to the two epidemic types were present on plates exposed to the air of the ward and were most numerous where the brunt of the infection occurred and after the dust of the ward had been stirred up. There was also an apparent increase in the degree of streptococcal air-pollution as the epidemic continued—72 colonies of hæmolytic streptococci on the first exposure and 224 a month later. On two occasions 76 per cent. and 86 per cent. of the children in the ward had hæmolytic streptococci in nose or throat or both. In more than half the cases the organism was numerously present in the nasal culture, a rare finding in the absence of nasal discharge, which strongly suggests that the streptococcus got there by inhalation of the contaminated air and dust. Allison (1938) on the basis of figures (of the number of streptococcal colonies on exposed plates) similar to our own has calculated that the air of such an infected ward must contain an astronomical number of hæmolytic streptococci, and, when it is remembered that each child is inhaling some 13 cubic feet of air per hour, "it does not need much stretch of the imagination to accept the view that infection by particles in the air is no chimera."

Cross-infection with scarlet fever is not uncommon in diphtheria wards. Three cases occurred in a particular ward within a period of three days; eight days after the first case nose and throat swabs were taken from all the children and staff in the ward, and six blood-agar plates were exposed for two hours on the following morning.

Apart from the patients with scarlet fever, two of whom were infected with *Str. pyogenes* type 3 (the

third was not typed), seven of the fifteen children in the ward were found to be streptococcal carriers; in six the streptococcus was recovered in practically pure culture from the nasal swab. When serologically typed, three of these carrier-strains belonged to type 3 and three to type 24; the seventh could not be typed. Two of the nurses were carrying hæmolytic streptococci: one type 13, the other "? type 13."

The six exposed plates grew a total of 48 colonies of hæmolytic streptococcus, and random pickings showed equal numbers (five each) of types 3 and 24. These findings are a repetition on a smaller scale of those already quoted and besides showing how quickly the infecting organisms are disseminated indicate that the air was the vehicle of spread.

It may be argued that these manifest or latent infections would not have happened in a bed-isolation ward, which is designed mainly to prevent the spread of infection manually or by fomites. We have no desire to belittle the value of bed-isolation methods, but we believe that part of their success is due to the fact that a bed-isolation ward usually contains a variety of infectious diseases which help to dilute each other. Medical superintendents have admitted that, if such a ward is overloaded with infections due to a particular organism—e.g., the streptococcus—the barrier is apt to break down. An example of this kind may be quoted.

In a bed-isolation ward cases of streptococcal infection—mostly tonsillitis and otorrhœa—predominated; one at least of these patients was infected with *Str. pyogenes* type 1 and one with type 6. A child some days after admission to the ward developed suppurative otitis media, which was found to be due to *Str. pyogenes* type 1, present in both throat and ear-discharge. The whole staff was swabbed, and six blood-agar plates were exposed in the ward for three hours. Three streptococcal carriers were discovered among the nurses, the serological types being type 27 twice and type 14. There were 28 colonies of hæmolytic streptococcus on the exposed plates, and out of eight of these examined serologically seven were type 1 and one type 6. Thus the infecting strain was numerously present in the air but not in the nose or throat of possible carriers; hence, if the bed-isolation ritual was being efficiently performed, aerial spread seems the only way in which cross-infection could have occurred.

Prevention of Air-borne Streptococcal Infection

The records and experiences of the past indicate that attempts to control institutional outbreaks of streptococcal infection by orthodox methods have not always been successful. MacGregor (1930) described an outbreak which necessitated the closing of the wards—no mention is made of disinfection—and which flared up again when the building was reopened with a new staff despite the enforcement of the strictest precautionary measures. As he says, "it is clear that the technique employed was still an ineffectual barrier against the spread of infection." We know of other similar happenings, and one lesson of the present outbreaks is the insufficiency of nursing methods which would preclude spread of infection by the accepted channels. Okell and Elliott (1936), after describing outbreaks of streptococcal infection in ear, nose, and throat wards, considered that the best methods of prevention were isolation of the infected patients on the balconies and behind screens *plus* the thorough cleansing of cubicles and wards after infection. As for similar infections in a general hospital, Keevil and Camps (1937), who recovered the infecting streptococcal types from the dust of the wards, found that the practice of all the accepted preventive measures did not check the spread of infection and finally adopted the procedure of transferring the streptococcal cases to the isolation hospital. Hart (1937) has recorded the difficulties in eliminating pathogenic bacteria from operating-theatres, short of sterilising the air.

These failures to control institutional outbreaks of streptococcal infection by orthodox methods point to some unconsidered factor which from the accumulated evidence we believe to be the infected dust and atmosphere. Bacterial pollution of the air may come about either by the aerial suspension of Wells's "droplet nuclei" expelled from the respiratory tract of the infective patient or by the stirring up of infected dust particles. Obviously, then, to counteract the aerial spread of bacteria, the air must be cleansed and the dust got rid of or rendered harmless. Two simple expedients are at hand. To clean the polluted air free ventilation is the easiest and probably most effective measure; it is particularly necessary in the winter months, when the risks of epidemic spread are greatest and the inclination to ventilate wards least. Its value in minimising cross-infection in bed-isolation and other wards was recently emphasised by McGarrity (1938). Damp dusting and sweeping and a more liberal use of soap and water are the best methods of dealing with dust, although their usage has gone out of fashion since the polished floor and polished furniture became popular in hospital wards. Their efficacy has been demonstrated in our experience by the negative findings on exposed blood-agar plates in the main puerperal ward at the North-Western Hospital. Probably not more effective and certainly more troublesome and expensive is the sterilisation of the air and dust by disinfectants—the latest of these are the spraying of the air and surfaces with aerosols and the use of ultraviolet light.

Other common-sense measures for preventing the spread of infection must not be neglected. The clinical case and persistent carrier must be isolated, and it should not be forgotten that the patient with an infective discharge is as likely to be a source for streptococcal air-pollution as the patient with an infection of the respiratory tract. Bed-isolation wards should not be overloaded with one kind of infection, and there must be a strict observance of the technique—e.g., the communal use of toys, books, and pencils, a not uncommon practice in children's wards, must be prohibited. Again, after diphtheria and measles (Allison 1938) children are particularly susceptible to streptococcal infection, probably because of their age and lowered resistance; hence in wards where such children are being nursed a careful supervision of new cases is required to prevent the admission of patients with tonsillitis or otitis media. If such infection does gain a foothold, the infected patients should be removed and the ward put in quarantine until the spread has been controlled.

Another important factor in the aerial spread of infection is the viability of the *materies morbi* in dust or atmosphere; for example, the meningococcus has presumably a low viability, since adequate bed-spacing is sufficient to reduce both the carrier-rate of the organism and the incidence of cerebrospinal fever. Or, again, the much greater likelihood of secondary infection in a ward after the introduction of measles as compared with pertussis is possibly associated with a greater viability of the measles virus, since the susceptibility of the child-population to the two diseases is very similar. If such is the case, the measles virus can be aerially spread, whereas the pertussis germ, although more forcibly expelled, would have a limited or droplet range of infectivity, which seems to fit the facts. Further work along

the lines initiated by Wells will help to solve this and allied problems.

Conclusions

Bacteriological and epidemiological observations on institutional outbreaks of puerperal sepsis and on streptococcal infections among children in diphtheria wards have convinced us that the aerial carriage of pathogenic bacteria can be an important factor in the spread of infection. Cleansing of the polluted air by free ventilation and the removal of infected dust by damp sweeping and dusting are two simple and probably effective measures for the prevention of air-borne streptococcal infection. The following points also arise out of our studies :—

PUERPERAL SEPSIS

(1) Patient-contacts may become vaginal or cervical carriers of the epidemic streptococcus and if not sought out may act as foci for the maintenance and spread of the infection.

(2) Just as a streptococcal sore-throat may be the source of an outbreak, so secondary cases of tonsillitis may occur concurrently with the infections of the genital tract.

(3) Great care in the taking of nose and throat swabs and provision for their proper bacteriological examination are required if potentially dangerous carriers are not to be missed.

STREPTOCOCCAL INFECTION IN CHILDREN'S WARDS

(1) After such infections as diphtheria and measles children seem to be very susceptible to the streptococcus ; in these wards special precautions, indicated in the text, are required to prevent the admission, or control the spread, of streptococcal infection.

(2) In the search for carriers nose as well as throat swabs should be taken, for more than half the contacts may be found to be nasal carriers.

(3) Even when the air and dust of the ward are laden with streptococci, nurse-carriers of the epidemic strains are not common, owing, perhaps, to their greater resistance and the intermittency of their stay in the ward.

We are indebted to Dr. H. Neisser for help with the serological typing of the streptococci and to a number of clinical colleagues for facilities and help in collecting the material on which our observations are based.

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A RARE FEATURE OF THE RAMSAY HUNT SYNDROME

WITH SOME OBSERVATIONS ON THE SENSORY SYSTEM OF THE SEVENTH NERVE

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IT is some thirty years since Ramsay Hunt (1906) first described in detail the syndrome which bears his name. Before that date several observers, including Grüber as early as 1875, had published accounts of herpes of the auricle arising alone or in association with the facial palsy. But Ramsay Hunt was the first to correlate these clinical findings in a coördinated manner and with such completeness and accuracy that his original statements have undergone little alteration. A few minor adjustments have since been made, mostly by the same author, but their appearance has been spread over rather a lengthy period. It may, therefore, be of interest to give a brief résumé of the subject.

HUNT'S CLASSIFICATION

In his original description, Ramsay Hunt classified his findings as follows :—

THE SYNDROME AND ITS CLASSICAL TYPES

(*a*) Herpes oticus.

(*b*) Herpes oticus with facial palsy.

(*c*) Herpes oticus with facial palsy and hypo-acousis.

(*d*) Herpes oticus with facial palsy and Menière's complex.

SUB-GROUPS OF THE SYNDROME

(*e*) Herpes facialis (trigeminal herpes) with facial palsy and auditory symptoms.

(*f*) Herpes occipitocollaris (herpes of 2nd, 3rd, and 4th cervical roots), with facial palsy and acoustic symptoms.

(*g*) Herpes zoster of the cephalic extremity (this means herpes facialis and/or herpes occipitocollaris) with auditory nerve complications.

He also drew attention to the possibility of multiple involvement of ganglia, both inside and outside the cranium, and in particular to the association of trigeminal, pharyngeal, and vagal zona with geniculate herpes. But the connexion of the chorda tympani or of the petrosal nerve had not at that time been fully appreciated, for no mention was made of them. However, in a later communication (Hunt 1909) he remedied this omission.

"... Supported by these facts," he wrote, "I would regard the sensory system of the facial nerve to be as follows :—to the tympanic cavity and its prolongation into the mastoid and eustachian tube by the petrosal nerves ; a vestigial innervation to the tongue and tonsillar region through the chorda tympani and lingual branches, and a cutaneous innervation in the interior of the auricle by fibres which pass out with the posterior trunk, some of which probably reach their destination, the posterior auricular branch of the seventh."

He described the zoster zone of the geniculate ganglion as being represented by a cone-shaped area which occupied the tympanic membrane, the walls

of the auditory canal, the external auditory meatus, concha, tragus, antitragus, and antihelix. Shortly afterwards the connexion of the auricular branch of the vagus was recognised and the idea of the posterior auricular branch of the facial nerve supplying cutaneous branches to the ear was dropped.

Ramsay Hunt's views were generally accepted and the syndrome remained unaltered for nearly ten years. During the interval, however, cases were published in which vesicles were present in areas outside the zone depicted above, although the other features of the condition remained unchanged. This led Hunt to revise his views on the anatomical distribution of the seventh nerve, and in a later article on the subject (Hunt 1915) he recapitulated most of his former findings and drew attention to three minor adjustments. These modifications referred to the occurrence of vesicles on the back of the ear and very occasionally on the anterior two-thirds of the tongue and the region of the soft palate adjacent to the tonsillar fossa.

"... In addition to the typical geniculate eruption in this area (i.e. the ear), herpetic vesicles were also present in the cleft between the post-mesial surface of the ear and the adjacent mastoid ... Another point of interest is that in two of the cases (Closier 1911, Palmer 1911) in conjunction with typical herpes in the geniculate area in the ear, there was associated an unilateral eruption of vesicles within the oral cavity, on the palate just in front of the anterior pillar of the fauces, which confirms the existence of a visceral remnant of geniculate innervation within the buccal cavity, indicated in my previous communication."

He then suggested that the postauricular eruption came within the province of the auricular branch of the vagus, and put forward the view that the palatal vesicles were accounted for by the lingual branch of the seventh nerve which innervates the styloglossus and the palatoglossus muscles and afterwards terminates as small filaments to the mucous membrane of the anterior pillar of the fauces and the adjacent tongue. There is little doubt that both these views are correct.

With reference to the presence of vesicles on the anterior two-thirds of the tongue, Hunt mentioned that he had seen one case of this nature, but that there were others on record (Eichhorst 1897, Seigheim 1895, Remak 1885, Bernack 1888) and pointed to the chorda tympani as the obvious explanation; but that is a point which may require modification and certainly will bear further discussion.

INVOLVEMENT OF AURICULOTEMPORAL AREA

About the same time, however, attention was drawn to another new feature by the late Dan McKenzie (1915). This writer described a case in which the seventh, eighth, ninth, and tenth nerves on one side were involved. Apart from a multiple nerve involvement, this case was also remarkable in that the recurrent laryngeal nerve was affected, but the writer added that: "... the point of fresh interest in connexion with the seventh nerve was the appearance in the scalp above the ear of three clusters of vesicles placed in a semi-circle about two inches above and behind the ear." Another case of temporal vesication in connexion with herpes of the geniculate ganglion has also been published by Guthrie (1926).

The area concerned lies within the province of the auriculotemporal nerve and it would be natural to suppose that the geniculate fibres reached their destination through the communication which exists in the parotid region between the upper division of the facial nerve and the auriculotemporal nerve. But this supposition, although feasible, is not completely satisfactory, because the rarity of vesicles in this area would lead one to doubt the presence of geniculate sensory fibres in the communication, which is both large and constant.

The anatomists commonly refer to the communication as one which is passing from the auriculotemporal nerve to the facial nerve and we would imagine that the rarity of vesicles in the temporal area would tend to confirm this point. It should also be remembered that the facial nerve communicates with the sensory supply of the posterior half of the scalp and the upper part of the neck and yet sporadic vesicles are very seldom seen in these areas.

We are not referring to the associated syndrome of herpes occipitocervicalis, which is considered to be a separate item, but in which it is possible that the occipitocervical anastomosis of the seventh nerve may play a part. This anastomosis ordinarily exists in a direct fashion between the facial nerve and the great auricular nerve, and less directly between the posterior auricular and the lesser occipital nerves, and in the neck between the cervical branch of the seventh and the anterior cervical nerves.

In the three cases of herpes occipitocollaris reviewed by Ramsay Hunt (1910) a facial palsy was present in each, but there were apparently no associated vesicles on the ear, palate, or tongue. If, therefore, the facial palsy in these cases was the outcome of a herpes of the geniculate ganglion, an anomaly was present which might well have depended upon an abnormal disposal of sensory fibres from the seventh nerve, in that they were diverted to the occipitocervical anastomosis from their normal destination. In this way the second and third cervical root zones would be amply covered and a satisfactory anatomical explanation afforded for many cases of herpes occipitocollaris.

The fourth cervical root zone would not be explained on this basis, although in those cases with a fourth cervical root ganglionitis the multiple involvement of ganglia would be reduced from four to two; but perhaps it is better to say that in these cases the explanation is not entirely satisfactory. To return to our original point, however, concerning the appearance of vesicles in the auriculotemporal area, it is possible and not improbable that some of the sensory fibres which pass along the great superficial petrosal nerve to the otic ganglion continue in the communicating branch of the latter to the auriculotemporal nerve (see diagram).

Since then no fresh items have been added to the symptomatology. It may be of interest, therefore, to record two cases of herpes of the geniculate ganglion in which a vesicular eruption appeared in an area supplied by the great superficial petrosal nerve—namely, in the nose and on the hard and soft palates. Hunt (1910), in reviewing those cases with a lingual eruption, mentions that there was an eruption on the hard palate in two of them (Seigheim 1895, Eichhorst 1897), but at that time the part played by the great superficial petrosal nerve in the production of a palatal rash had not been recognised, and no further attention has since been drawn to this association nor a case of that nature recorded.

CASE-RECORDS

CASE 1.—A woman aged 52 developed acute pain in the left ear, the cause of which was not apparent on physical examination. Two days later a number of vesicles appeared on the external surface of the

ear and were confluent by the next day. The whole ear became greatly swollen and by the sixth day had the appearance of a cellulitic infection. There was a large amount of purulent exudate which dried quickly giving the ear a very septic appearance. The external auditory meatus was closed and it was not possible to see the drum. The whole organ was very tender and pain was a prominent feature. On the eighth day a well-developed facial palsy appeared and the patient complained of sore-throat. There was a unilateral vesicular eruption on the hard and soft palates. The vesicles were small and discrete and were surrounded by a ring of hyperæmia. There were seven vesicles on the hard palate and two on the soft palate, which was swollen to about twice its normal size. The whole area was hyperæsthetic. There was a slight serosanguineous discharge from the left nostril and an inspection of the nasal chambers revealed two more vesicles situated anteriorly on the lateral aspect. It was possible that more were present posteriorly. There was also a mild conjunctivitis in the left eye. The tongue appeared normal to inspection but there was a definite blunting of gustatory sensibility as tested with salt and sugar. There was no coincident weakness of the soft palate, which moved well on phonation. The Wassermann reaction was negative. The case proceeded in the usual fashion and the palsy had recovered four months later.

CASE 2.—A man of 48 was knocked down by a motor-car in December, 1930, and sustained a fracture of the base of the skull which caused a discharge of blood and cerebrospinal fluid from the left ear. He was treated in a nursing-home for six weeks and returned to his home for two months, after which he resumed his work in the city. He had no complications from the cranial injury and was annoyed at being kept in bed for nearly six weeks following the accident. A year later he appeared to be in good health and was working hard. In February, 1932, just over two years after the accident, he developed pain in the left ear and, thinking that it might be connected with his original injury, he consulted one of us (C. P. G. W.). The external auditory meatus was swollen and painful and the patient was admitted to a nursing-home. The following day some small vesicles became evident on the œdematous floor of the meatus. The vesicles broke down and discharged profusely for a week. About the same time vesicles were noticed on the hard and soft palates, limited to the left side. On examination of the nose three definite vesicles were seen just inside the left nostril. Nine days after the first appearance of the pain a definite facial paralysis was discovered. The Wassermann reaction was negative. The tongue appeared a little swollen, especially on the left side. The patient was kept in bed for a week. The discharge from the ear cleared up and the œdema disappeared so that it was possible to examine the drum, which was very inflamed. The facial paralysis gradually cleared up after three and a half months. When seen a year later the patient appeared to be in good health.

GREAT SUPERFICIAL PETROSAL NERVE

The great superficial petrosal nerve, on which the unusual characteristics of the rash depend, deserves more importance than has hitherto been accorded it. Originally thought to be motor in character, it is now known to be a mixed nerve containing two systems of fibres—namely, a sensory set originating in the cells of the geniculate ganglion and a parasympathetic set comprising autonomic connector fibres which arise in the facial nucleus and relay in the sphenopalatine ganglion. Both portions of the nerve are distributed ultimately with the branches of the sphenopalatine ganglion, and it may be asked why such a large and constant branch of the geniculate ganglion should so seldom provide a vesicular eruption in a herpes zoster of that ganglion.

As we have mentioned, there appear to be only two other records of a rash on the hard palate; this rarity is curious and difficult to explain. It may be due partly to the distribution being concerned with areas which subjectively do not draw attention as do the swollen ear and the palsy and objectively are likely to be overlooked unless the observer makes a point of examining them. Or it is possible that the anatomical disposition of the nerve on or near the periphery of the ganglion may render it less likely to be involved in a disturbance of the ganglion, in which presumably the greatest force of the trouble occurs in the centre. Neither explanation is completely satisfying, but the issue is not of great moment. Of more practical importance, however, is the destination and function of two branches (or communications) of the great superficial petrosal nerve which are given off before it finally merges in the vidian nerve. These two branches are respectively one to the tympanic plexus and the other to the otic ganglion.

For some years it has been known that pain arising in affections of the posterior ethmoidal and sphenoidal air sinuses may be referred to the ear; and it may safely be assumed that this is accomplished through the great superficial petrosal nerve and its communicating branch to the tympanic plexus (see diagram). Indeed, the whole of the sphenopalatine distribution may be referred in this manner, and it therefore follows that pain arising in the soft palate may be referred to the tympanic plexus by this branch as well as by the tympanic branch of the glossopharyngeal nerve—a point not commonly appreciated. With reference to the communicating branch to the otic ganglion, it has already been suggested that this branch may constitute a pathway for those fibres which are responsible for the appearance of vesicles in the auriculotemporal area. A point of further importance is that it may also form a mode of conveyance of taste fibres from the geniculate ganglion to the chorda tympani via the otic ganglion (see diagram).

DISTRIBUTION OF TASTE FIBRES

Ever since the effects of the operation of gasserianectomy were analysed, there has been speculation as to the connexion of the fifth nerve with the gustatory mechanism. Gowers (1902) described the effects of this operation in five cases (four by Horsley, one by Ballance), and stated that in all of them taste was lost over the anterior two-thirds of the tongue and in two over the whole organ. He therefore gave it as his decided opinion that the transmission of taste impulses, not only from the chorda territory but also from the glossopharyngeal territory, was via the trigeminal nerve. On the other hand, Cushing (1903), in a larger series of cases, reports that in his experience taste is never completely or permanently lost in the anterior two-thirds of the tongue, although it may be abolished or lessened temporarily

Undoubtedly these latter results completely negative the possibility of the gustatory pathway passing through the fifth nerve, but Gowers's statement shows equally clearly that this pathway passes in close proximity to the gasserian ganglion. Differences in surgical technique would account for the divergence of results if one assumed that the taste fibres travelled underneath the ganglion instead of through it. This assumption, however, leads to another, equally patent and important—namely, that the fact that Gowers's cases all showed loss of taste can only reasonably be accounted for on the grounds of a high incidence of taste fibres in the

petrosal route. It would be straining the law of chance too widely to suppose otherwise.

Woollard (1933), in reviewing his experiences on the results of the injection treatment for trigeminal neuralgia, states that he found taste affected in about half the cases after operation on the gasserian ganglion (Carmichael and Woollard 1933). As it is highly improbable that the petrosal nerves would be injured in every case of this nature, it is reasonable to suppose that the approximate incidence of taste fibres present in that route is still higher, so that 50 per cent. would be on the conservative side.

We are not familiar with the original experiments which resulted in the chorda tympani being identified as the pathway for taste; but, as the results were uniform, it is fairly certain that this experimental section, possibly for the sake of accuracy or simplicity, was carried out close to the lingual nerve. If the section of the chorda tympani had been carried out proximal to its junction with the communicating branch from the otic ganglion, the results would certainly have been quite different (see diagram).

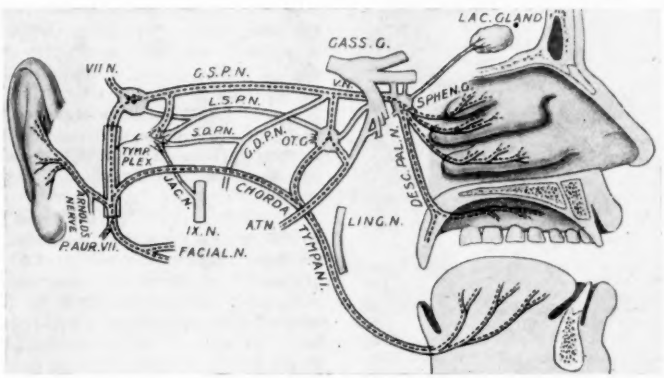

Diagram of the sensory system of the seventh cranial nerve

A.T.N.: Auriculotemporal nerve.
DESC. PAL. N.: Descending palatine nerves.
G.D.P.N.: Great deep petrosal nerve.
G.S.P.N.: Great superficial petrosal nerve.
GASS. G.: Gasserian ganglion.
JAC. N.: Jacobsen's nerve.
LAC. GLAND: Lacrimal gland.
LING. N.: Lingual nerve.
L.S.P.N.: Lesser superficial petrosal nerve.
OT. G.: Otic ganglion.
P.AUR. VII: Posterior auricular branch of facial nerve.
S.D.P.N.: Small deep petrosal nerve.
SPHEN. G.: Sphenopalatine ganglion.
TYMP. PLEX.: Tympanic plexus.
V.N.: Vidian nerve.

Thus it appears that a dual pathway exists for the conduction of taste impulses to the anterior two-thirds of the tongue and it is probable that the fibres avail themselves of the two routes at the same time, although they usually preponderate in one or other so that this constitutes the major pathway. When section of one route fails to produce any loss of taste, it does not follow that no taste fibres were cut, but merely that they were present in the alternative pathway. Conversely, when ageusia is noticed after the section of a nerve, it does not necessarily follow that all taste fibres are absent from the alternate pathway for two reasons. In the first place, taste is a sense that requires for its perception both time and cultivation, and after section of the major pathway the remaining taste fibres can hardly be expected to take over straight away the transmission of gustatory impulses as skilfully as their predecessors; but, given time and perseverance, they will sometimes respond, as some of Cushing's cases show. Secondly, taste fibres have a relatively high threshold to stimulation and consequently may fail to respond unless there is adequate representation in number. In other words, the extent and intensity of gustatory stimulation are reduced to a subliminal level through the meagreness of the receptive mechanism. Even normal people with a full complement of taste fibres often find difficulty in appreciating a variety of tastes; hence it is not surprising that when the taste mechanism is reduced suddenly by half or three-quarters nothing is tasted at all.

Gowers's statement concerning the loss of taste in the posterior third of the tongue may be answered though not explained. It is impossible to account morphologically for the presence of glossopharyngeal fibres in the vicinity of the gasserian ganglion with the function that Gowers ascribed to them; and the complete absence of any records of similar ageusia is perhaps the best explanation of the failure of attempts to account for it.

Vesicles on the tongue in herpes of the geniculate ganglion are regarded by some authorities as not uncommon. In a recent textbook, Brain and Strauss (1934) state that "geniculate zoster is normally associated with typical zoster vesicles in the auricle and less often on the tongue." Hill (1936) wrote that "vesicles are often seen on the anterior two-thirds of the tongue." In Hunt's own cases there were several instances of gustatory disturbance, but only one of lingual vesication, and he had collected four others from the literature, as has already been mentioned. We have been able to find one other (McDonald and Taylor 1931). It is doubtful therefore whether vesicles on the tongue are really common—their incidence is probably under 5 per cent.—although their appearance there is not so rare as on the palate. As Hunt pointed out, their occurrence depends on an abnormal presence of ordinary sensory nerve-fibres in the gustatory pathway.

SUMMARY

A résumé is given of the Ramsay Hunt syndrome and two cases described in which a vesicular rash was present on the hard and soft palates and in the nose, in addition to the usual auricular eruption and facial palsy.

Attention is directed to the wide field which may be the seat of a vesicular eruption, which depends upon the frequent association of the seventh nerve sensory fibres with the sensory branches of neighbouring nerves. Certain cases of herpes occipitocollaris which are limited to the second and third cervical root zones may depend on the intimate anastomosis which is known to exist between the seventh nerve and the second and third cervical nerves, rather than on a ganglionitis of those roots.

The importance of the great superficial petrosal nerve as a sensory vehicle is emphasised. In this respect it probably has four distinct properties: (*a*) By means of its tympanic branch, it is responsible for all pain referred to the tympanic plexus from areas situated within the sphenopalatine nerve distribution with the exception of the soft palate,

which it serves jointly with the glossopharyngeal nerve. (*b*) It may provide, via the otic ganglion, a major pathway for the passage of gustatory fibres to the anterior two-thirds of the tongue, and it is suggested that this route is chosen in at least half the cases. Some of the autonomic secretory fibres to the chorda territory may also be conveyed in this manner, relaying in the otic ganglion. (*c*) It may be responsible for the passage of sensory fibres to the auriculotemporal area via the otic ganglion and its communicating branch to the auriculotemporal nerve. (*d*) Its distribution comprises the whole of the sphenopalatine territory, in which the whole area of the hard palate should be included.

The rarity of vesicles on the anterior two-thirds of the tongue is commented upon.

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THE SHIPWAY MACHINE AND CLOSED-CIRCUIT ANÆSTHESIA

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IT is not my intention to embark upon a detailed description of the carbon-dioxide absorption technique in general anæsthesia or of the various apparatus designed for its use, but rather to bring to the notice of those interested in closed-circuit methods one particular machine which, in my hands at any rate, has proved during nearly two years' use to be very efficient, extremely practical, and productive of very satisfactory results with various types of general anæsthetics.

At the same time it may be of interest rapidly to review the recent history and development of the carbon-dioxide absorption technique in this country and briefly to outline the rationale and advantages thereof. This is necessary for a proper appreciation of the machine under consideration.

HISTORY

Hewer used an early form of closed circuit in 1925 when working with ethylene. This was of the single-phase type, the gases passing to and fro between the patient and the re-breathing bag through a single wide-bore tube. The agent for absorbing the CO_2 was interposed and thus was encountered by the gases twice during each cycle of respiration. Evans (1932) described an improved circuit in which the gases, by means of non-return valves, circulated continuously through the apparatus and the patient by two tubes, one for inspiration and one for expiration. Thus the difficulty of dead space was overcome. Both tubes, however, passed through the absorbing agent, which was thus again encountered twice per respiration.

In 1933 Harris gave an account of a greatly improved machine which was the forerunner of the modern biphasic or continuous-circulation types, in which the gases passed through the absorbing agent only once on their way round. Further work on the subject in this country was done by Primrose (1934), Halton (1935), and Harris (1935). In 1935 Sir Francis Shipway designed the machine which is later to be described and he took it to America with him in June of that year. In 1936 interest in carbon-dioxide absorption was further stimulated by Dr. Ralph Waters's visit to this country from America, when he demonstrated his own methods, the outcome of his work on the subject there. Since then several machines have been designed for the method and the necessary parts devised to convert existing types of machine, such as the Boyle and McKesson's. A typical example of a machine designed specifically for the carbon-dioxide absorption technique is that of Nosworthy (1935) and Hewer (1937). As in most fields of endeavour, the machine designed primarily for the purpose in view has proved itself to be by far the better instrument.

GENERAL CONSIDERATIONS

The method consists essentially in administering to the patient definitely known and measured quantities of inhalation anæsthetic drugs together with only enough oxygen to meet his metabolic needs. The anæsthetic drugs are exhaled unchanged, less the oxygen administered, but with its place taken by the carbon dioxide produced by the body. The latter gas is removed chemically, fresh oxygen in the necessary amounts is added, and the "refreshed" anæsthetic gases are returned to the patient. The cycle is repeated indefinitely. By this technique anæsthesia is induced and maintained with the minimal quantity of drugs and with known amounts of them, and the patient re-breathes his own warmed and humid vapours throughout the anæsthesia. The loss of fluid and heat normally taking place in the "continuous-flow" or "intermittent-flow" methods and the waste of anæsthetic drugs are therefore reduced to a minimum, which is limited by the sum of diffusion through the patient's skin and the rubber of the re-breathing bag plus any leaks in the machine and the joint between it and the patient.

In practice the anæsthesia is started as a "continuous-flow" administration and the circuit closed completely after a minute or two (by shutting the expiratory valve) when as much as possible of the inert gases—e.g., nitrogen—present in the patient's tissues and in the machine have been expelled by his expirations. The state of affairs then is that the patient's tissues are saturated with the maximal concentration of anæsthetic gas compatible with just sufficient oxygen to maintain a healthy colour and function. The supply of gas is shut off at the same time as the circuit is closed and the oxygen regulated according to needs, usually about 200–500 c.cm. per minute. Ether or other volatiles can be added as required either by allowing them to be carried over with the oxygen supply or by allowing the circulating gases to pass through or over the liquid drugs in suitable vaporisers or by drip-feeds placed in series in the circuit. Ethylene or cyclopropane may be used instead of nitrous oxide, provided the machine is fitted with the necessary flow-meters designed to measure the flow of these gases. In fact, owing to the high cost of cyclopropane the carbon-dioxide

absorption technique is the only practical way of using it.

Two main methods of applying these principles may be described: the monophasic and the biphasic. In the former the absorbing agent is interposed between the face-piece and the re-breathing bag (Hewer 1925) of an ordinary gas-oxygen-ether machine, and to-and-fro respiration takes place. In the latter, by means of valves, a true circuit is formed, the gases passing continuously round and through the various parts of the system and the patient in one direction only. In the most efficient machines ether is added by means of a vaporiser or a drip-feed in the main circuit. The biphasic method, though entailing slightly more cumbersome and complicated apparatus, has definite advantages, for it overcomes the problem of "dead space," and the internal resistance set up by the absorbing apparatus is only encountered once per respiration. This is quite enough to absorb the CO_2 efficiently.

The principal agents that have been tried for the purpose of absorbing the carbon dioxide are soda-lime and caustic soda. Although caustic soda is a more efficient absorber and has twice as long a life, the formation of "carbonate mud" which it causes in the machine is a nuisance. Further, the handling of a strong caustic solution in a portable apparatus presents so much difficulty that the method must be regarded as almost impracticable. Thus soda-lime in granular form is now chiefly used.

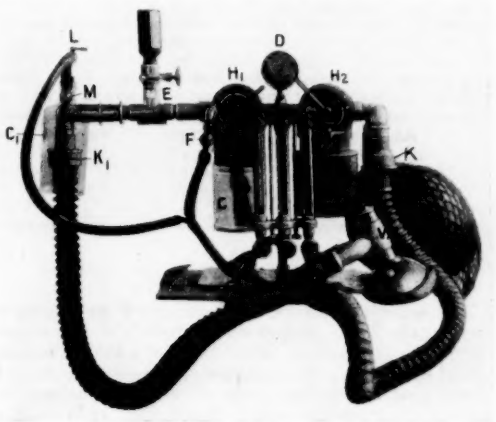
The advantages of closed-circuit technique may be summarised briefly as follows:—

(1) Conservation of the patient's body-heat and body-fluids in so far as they are exhaled by the respiratory system.
(2) Conservation of muscular energy owing to the quiet respiration which results from the absorption of the CO_2.
(3) The absence of "exhaust gases" permeating the theatre and making life unpleasant for the staff.
(4) Minimisation of the risk of explosion.
(5) Ability to build up high concentrations of anæsthetic substances with small quantities thereof.
(6) Complete control (by cutting the absorber in and out as required) of the CO_2 content of the patient.
(7) Very considerable reduction of post-anæsthetic vomiting.
(8) Administration of minimal amounts of the more toxic agents, such as ether.
(9) Extreme flexibility in all directions.
(10) Extraordinary economy in the use of both gases and volatiles.

THE SHIPWAY MACHINE

The Shipway apparatus is of the biphasic type, uses soda-lime as its absorbing agent, and has been built primarily for closed-circuit anæsthesia. It was designed by Sir Francis Shipway and originally constructed for him by A. Charles King Ltd. in 1935. It was used extensively by him in private practice as well as at Guy's Hospital and St. Peter's Hospital. It was at the latter hospital that I was first privileged to see it in action.

The machine is intended for use either with nitrous oxide or cyclopropane and to this end is fitted with three dry flow-meters calibrated for these two gases and for oxygen. Any other anæsthetic gas may be equally well used, because the machine is so constructed that any of the flow-meters can be changed in a couple of minutes with ease. These flow-meters are grouped centrally on the body of the apparatus (see figure, A_1, A_2, A_3) and controlled by small finger-wheels capable of very fine adjustment. The gases pass from the flow-meters to a common passage which enters the main circuit just before it reaches the ether vaporiser (C). The latter is of glass and is of the wick type. The flow of gases through or by-passing it is controlled by a valve formed of a hollow cone revolving in a cone-shaped socket $(H)_1$ and operated by a lever. Apertures in the cone and socket are arranged so as to ensure that any desired percentage of the gases may be deflected through the vaporiser. In the machine as it was originally constructed the gases passed direct from there to the delivery end of the



Shipway machine. A_1, A_2, A_3, flow-meters; B, soda-lime canister; C, ether vaporiser; C_1, bubble-through bottle for ether; D, manometer; E, drip-feed; EV, expiratory valve of Magill type; F, by-pass tap for oxygen; G, re-breathing bag; H_1, valve controlling supply to ether vaporiser; H_2, valve controlling supply to soda-lime canister; K, K_1, Siebe Gorman valves; L, tap controlling supply of oxygen to bubble through ether bottle; M, stop-cock to cut off whole unit from main circuit.

apparatus through a special wide-diameter Siebe Gorman non-return valve (K_1) and wide-bore rubber hose.

The figure shows the machine as modified by me and in use now, with a drip-feed (E) of Goldman type (Goldman 1937) for vinyl ether interposed in the main circuit between the ether vaporiser and the outlet, and a bubble-through bottle for ether (C_1) coming into the circuit at the outlet end of the machine. The latter works from a supply of oxygen bubbled through it from a by-pass from the main supply and is controlled by a tap (L). The whole unit can be cut off from the main circuit and, if desired, removed in toto by using a stop-cock (M) at its point of entry. The object of this additional ether bottle is to provide a high concentration of ether if it is desired to use the method of pharyngeal insufflation. The re-breathing bag and absorber have to be cut out of the circuit at the same time. It was found in practice that the wick vaporiser could not be relied on to produce a sufficiently high concentration for this purpose, though for closed-circuit technique its capabilities are ample and the superior delicacy of control which it provides is much appreciated.

At the delivery end of the apparatus there is an expiratory valve of Magill type (EV), and provision is made for the fitting of a McKesson face-piece or endotracheal connexion. Further, the whole machine can be cut off from the patient and the outside air by a special valve incorporated in the body of the expiratory valve and operated by giving the whole valve assembly about a quarter of a turn. The object of this is to enable the constitution of the

anæsthetic atmosphere in the machine to be preserved while the latter is temporarily disconnected from the patient for the purpose of intubation or other manipulation. A return length of hose passes the gases back to the soda-lime canister (B) through another Siebe Gorman valve (K). Entry for the gases to the canister is controlled by another cone-and-socket valve (H_2) identical with that operating the ether vaporiser. The canister communicates with the body of the machine close to the flow-meters on the side opposite to the ether vaporiser. The re-breathing bag (G) is attached at right angles to the main circuit just before it enters the soda-lime canister. The circuit is thus completed by the arrival of the gases from the soda-lime canister, minus their carbon-dioxide content, back in the body of the apparatus just above the flow-meters. Here they pick up fresh oxygen, and the whole cycle is repeated. A manometer (D) is fitted in the body of the machine above and behind the flow-meters. A rubber tube from the source of supply of oxygen leads direct into the main circuit on the outlet side of the apparatus, by-passing the oxygen flow-meter and the body of the machine and controlled by a tap (F). This allows a full flow and provides for emergency oxygen under pressure.

THE MACHINE IN USE

The machine can be used in many and diverse ways: (1) As a simple continuous-flow apparatus for gas-oxygen-ether, with the soda-lime canister out of circuit and the expiratory valve open; (2) for pharyngeal insufflation after an ordinary induction, with the expiratory valve closed, the re-breathing bag and soda-lime canister out of circuit, and the bubble-through ether-bottle in action; (3) for carbon-dioxide absorption technique.

For this purpose the induction is carried out as a continuous-flow anæsthesia, if nitrous oxide is the gaseous agent to be used. As soon as all the nitrogen possible has been eliminated, the flow of gas is stopped, the expiratory valve closed, and the oxygen regulated as required. Ether is added as may be needed by passing some or all of the gases through the wick vaporiser. This vaporiser is capable of very fine adjustment, and truly minimal quantities of ether can be added. For example, a light but consistent depth of anæsthesia, sufficient for extra-abdominal work, has been maintained for 1½ hours with as little as 1 oz. of ether.

The soda-lime canister can be cut in and out of the circuit very simply by its valve and complete control of the carbon-dioxide content achieved. Small additions of gas may be needed from time to time to compensate for diffusion through the patient's skin and the rubber of the machine and for loss through any leaks. The better the joint between patient and machine the less gas (and ether) will need to be added. Positive pressure is readily produced by adding excess of gas or oxygen and is easily controlled by watching the manometer. This useful adjunct also gives a very good idea of the volume, rhythm, and type of the respiration (and thus of the depth of anæsthesia) by the swing of the needle. Approaching exhaustion of the soda-lime is indicated by a rising pressure and an exaggerated hyperpnœic swinging. Positive pressure does not appear appreciably to affect the depth of nitrous-oxide anæsthesia; but if ether is used considerable increase in depth is rapidly produced by it.

(4) For open or closed-circuit gas-oxygen-vinyl-ether sequence; alternatively vinyl ether may be added to any administration.

(5) For cyclopropane anæsthesia, when induction is initiated with the circuit closed by one of the many minor variations in the induction technique of the gas, or again cyclopropane may be added to a gas-oxygen anæsthetic.

(6) By attaching a nasal inhaler to the delivery end of the apparatus instead of a face-piece or endotracheal connexion, very successful dental anæsthetics may be given, for ample pressure is available, the nitrous oxide flow-meter being calibrated to 20 litres per minute and allowing a flow considerably in excess of this if really needed. In this type of work it is very helpful to have the vinyl-ether drip-feed also in action. A few cubic centimetres of vinyl ether sometimes makes all the difference to the success of a dental anæsthetic administered to a robust patient, averting an imminent bloodstained battle with a plum-coloured patient and producing in its stead a tranquil performance on a well-oxygenated subject. The recovery and after-condition of the patient are not affected in the least by the small amount of vinyl ether needed.

It can thus be seen that this machine is wellnigh universal in its application.

ADVANTAGES

In addition to its great adaptability the following advantages are claimed for the modified Shipway machine:—

(1) It is small and compact, measuring (without drip-feed attached) about 12 × 12 × 5 in.

(2) It is easily mounted: (*a*) on its own plinth for use on a table or trolley, by a short vertical rod based on the plinth and passing through a ring and socket attached centrally on the body of the machine (see figure); or (*b*) on the rod of a cylinder stand or anæsthetic trolley in a similar manner.

(3) Being made to a great extent of aluminium alloys it is very light.

(4) Its lightness and compactness make it very easily portable.

(5) It can be taken completely to pieces easily and quickly and can be cleaned simply and with dispatch—an important point in a closed-circuit apparatus.

(6) It is economical, using only 3–4 gallons of nitrous oxide per case and about 1–2 oz. of ether per hour on an average when used for general anæsthesias.

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POSTOPERATIVE THROMBOSIS AND EMBOLISM

REPORT OF A TRIAL OF EPHEDRINE AND ATROPINE AS A PROPHYLACTIC

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INJECTIONS of ephedrine and atropine have been recommended by various authors (1938) as a prophylactic against thrombosis and embolism. Bankoff (1934), using Ephetonin and atropine, claimed that not one patient treated by this method had developed complications. A trial of this remedy was undertaken at University College Hospital by Mr. Gwynne Williams, using ephedrine and atropine injected on the 5th, 7th, and 9th days after operation, as suggested

by Bankoff. This report is an analysis of this trial over a period of two years.

SELECTION

The treated series consists only of those patients operated on by Mr. Gwynne Williams or admitted under his care for the treatment of injuries. Patients admitted to his beds but operated on by deputies are excluded. Patients not treated by operation—for example, those admitted for investigation or observation—are also excluded. Every case therefore was one of trauma either operative or accidental. As a control series I have taken the cases for the preceding five years selected in the same way.

Cases of thrombosis and embolism are divided into four groups: (1) thrombosis only; (2) thrombosis and non-fatal pulmonary embolism; (3) non-fatal pulmonary embolism without recognised thrombosis; and (4) fatal pulmonary embolism with or without recognised thrombosis. All fatal cases were verified by post-mortem examination. The only cases of thrombosis diagnosed were those in which the veins of the lower limbs were affected. No thromboses of the pelvic and hypogastric veins, as described by Ducuing (1929), have been diagnosed.

PROPHYLACTIC TREATMENT

The prophylactic treatment consisted of the hypodermic injection of atropine sulphate gr. 1/100 and ephedrine hydrochloride gr. ¼ on the 5th, 7th, and 9th days after operation. These injections were given to all adults in the treated series but not to children. The youngest age at which thrombosis was observed in this series is 27. Children have been included in the report so that the age-distribution of cases in the control and treated series might be compared. The treatment has been in the hands of house-surgeons and ward sisters and with changes in these appointments it has occasionally been forgotten. Usually, but not always, the injections were recorded on the temperature chart. In two of the ten cases of thrombosis and embolism there is no record of the injections having been given, and they may have been omitted. In the other eight the injections are recorded. In the group of injuries not treated by open operations the injections do not appear to have been regularly given, but in the treated series there are only 16 cases in this group.

RESULTS

The gross incidence of thrombosis and embolism in the two series is shown in table I. The difference in the percentage incidence is not significant, being less than twice the standard error of the difference. These figures show that the injection of ephedrine and atropine on the 5th, 7th, and 9th days does not prevent postoperative thrombosis and embolism. The extent to which the control and treated series are comparable is shown in tables II, III, IV, and V. In the treated series there is an increase in the proportion of females and of patients over 60. It is to be expected that, other things being equal, these factors would be associated with an increase in thrombosis and embolism. In the "limbs" group in table V the contribution of fractures of the neck of the femur treated by operation calls for special comment. In the control series 5 out of 10 developed thrombosis and embolism, in the treated series only 1 out of 13. It had been realised that this operation had a high incidence of thrombosis and embolism, and other steps were taken to prevent these complications, chiefly in the direction of minimising immobilisation. It is doubtful therefore whether any credit is due to ephedrine and atropine for the diminished incidence in this group. If this group is excluded in the calculation of the gross incidence, the treated series shows a higher incidence than does the control. The exclusion of this group, moreover, reduces the difference in age-distribution and sex-incidence in the two series; hence the remainders are more strictly comparable. In view of the differences in age-distribution and sex-incidence of the two series and the doubt about injections in two of the cases in the treated series it is not possible to conclude from these figures that ephedrine and atropine have no influence on thrombosis and embolism,

TABLE I—GROSS INCIDENCE OF THROMBOSIS AND EMBOLISM IN CONTROL AND TREATED SERIES

Series	Cases	Thrombosis and embolism					Total as percentage of series	Difference (per cent.)	Standard error of the difference
		Thrombosis only	Thrombosis and embolism	Embolism only	Fatal embolism	Total			
Control	1265	15	6	4	8	33	2·61	—	—
Treated	406	7	—	1	2	10	2·46	0·15	0·089

TABLE II—SEX RATIOS OF WHOLE SERIES AND OF THROMBOSIS AND EMBOLISM

Series	Sex	Cases in series	Cases of thrombosis and embolism
Control ..	Males	641	16
	Females	624	17
Treated ..	Males	194	3
	Females	212	7

TABLE III—AGE-DISTRIBUTION OF CONTROL AND TREATED SERIES

Age	Controls			Treated		
	Cases		Percentage of series	Cases		Percentage of series
0– 4	27			3		
5– 9	36	111	8·77	10	27	6·65
10–14	48			14		
15–19	72			16		
20–24	121	303	23·94	37	79	19·46
25–29	110			26		
30–34	85			28		
35–39	93	267	21·11	30	82	20·20
40–44	89			24		
45–49	106			40		
50–54	108	339	26·80	34	108	26·60
55–59	125			34		
60–64	92			35		
65–69	77	211	16·68	36	91	22·41
70–74	42			20		
75–79	17			9		
80–84	7	26	2·05	5	15	3·69
85–89	2			1		
Not recorded	—	8	0·63	—	4	0·99
Total	1265			406		

but there is no evidence from this trial that they have any beneficial effect.

Any scheme of prophylaxis against thrombosis and embolism that is not started until the 5th day after trauma is inadequate. In a series of 440 cases of fatal pulmonary embolism following injuries and operations which I have collected, 78 occurred within the first five days after trauma (Pilcher 1937). There can be little doubt that in some the causal thrombosis formed before operation, and it would seem to be a mistake to limit prophylactic measures to the postoperative period.

TABLE IV—AGE-DISTRIBUTION OF CASES OF THROMBOSIS AND EMBOLISM

Age	Controls			Treated		
	Cases in series	Thrombosis and embolism		Cases in series	Thrombosis and embolism	
		Non-fatal	Fatal		Non-fatal	Fatal
0–14	111	0	0	27	0	0
15–29	303	1	0	79	0	0
30–44	267	5	1	82	0	0
45–59	339	8	3	108	4	0
60–74	211	10	3	91	3	1
75–89	26	1	1	15	1	1
Not recorded	8	0	0	4	0	0
Total	1265	25	8	406	8	2

TABLE V—INCIDENCE OF THROMBOSIS AND EMBOLISM IN SIX GROUPS OF CASES

Operation group		Cases in group	Group as percentage of series	Non-fatal	Fatal	Total	Total as percentage of group
Abdominal	Controls	453	35·81	16	3	19	4·19
	Treated	161	39·66	5	—	5	3·11
Genito-urinary	Controls	93	7·35	2	1	3	3·23
	Treated	19	4·68	1	—	1	5·26
Trunk	Controls	141	11·15	2	1	3	2·13
	Treated	33	8·13	1	—	1	3·03
Head and neck	Controls	193	15·26	—	—	—	0·00
	Treated	69	17·00	—	1	1	1·45
Limbs	Controls	289	22·85	5	2	7	2·42
	Treated	108	26·60	—	1	1	0·93
Injuries	Controls	96	7·59	—	1	1	1·04
	Treated	16	3·94	1	—	1	6·25

SUMMARY

A series of 406 cases of accidental trauma and operation were treated with hypodermic injections of ephedrine and atropine as a prophylactic against thrombosis and pulmonary embolism, the injections being given on the 5th, 7th, and 9th days after accident or operation. The incidence of thrombosis and embolism was approximately the same as in a control series of 1265 cases.

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PNEUMOCOCCAL MENINGITIS TREATED WITH M. & B. 693

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SINCE very few reports of pneumococcal meningitis treated with M. & B. 693 have been published, the following case is recorded in the hope that it will encourage others to try this drug in the treatment of this as well as the other pyogenic forms of meningitis.

CASE-RECORD

A male, aged 24, felt unwell and had a "cold in the head" on Feb. 21, 1939. He continued at work until the 24th, when he stayed at home. He felt better on the following two days, and on the 26th he dined out and later danced. On the 27th he awoke with a headache and did not feel well enough to go to work; he could not eat. In the evening, not feeling so well, he took his temperature and found that it has risen to 103·0° F. He collapsed at 7 P.M. and remembers little of what passed during the next twelve hours. He was seen by one of us (G. C. T.) at 8 P.M. His temperature was 103·0° F. He had vomited and complained of generalised pains and headache. There were no physical signs.

On the 28th his temperature was 100·0° F. and his pulse-rate 78. He had vomited once but otherwise had had a fair night. He complained of severe headache and was confused in his speech. He was removed to a nursing-home where, later, an enema was given with a good result.

On March 1 his temperature was 99·8° F. and his pulse-rate 70. He was less stuporose but had stiffness of the neck, rigidity of the abdomen, and a positive Kernig's sign. A diagnosis of meningitis was made.

When he was seen in consultation the same evening his temperature was 102·0° F. and his pulse-rate 92. He was conscious and complained of severe headache (frontal and occipital) and of double vision. He could not move his head, trunk, or legs without exciting pain. The head was slightly retracted, there was rigidity of the posterior neck muscles, and Kernig's sign was positive. The pupils were slightly dilated and reacted normally. There was almost complete paralysis of the right external rectus muscle. The fundi and remaining cranial nerves were normal, and nothing else abnormal was found on examination of the central nervous system, except a depression of the arm reflexes. The skin was moist and showed no eruption. There was no cough, and the lungs were clear. There was no discharge from the ears or nose. Meningitis, due to one of the pyogenic organisms, seemed highly probable. M. & B. 693 1 g. was given at 9 P.M., and a further 0·5 g. was ordered for the morning.

At 9.30 A.M. on the 2nd his temperature was 101·0° F. and his pulse-rate 76. He had slept some hours as a result of an injection of heroin gr. $\frac{1}{6}$. No further vomiting had occurred. The signs of meningitis had not altered. Lumbar puncture showed a slightly turbid fluid under moderate pressure containing 2800 polymorphs, 160 lymphocytes, 0·04 per cent. protein, pneumococci on film and culture, and a trace of M. & B. 693. A further 4 g. of the drug was ordered to be given by 10 P.M.

At 9.15 A.M. on the 3rd his temperature was 98·6° F. and his pulse-rate 70. He had slept better and had sweated profusely. His headache was less. He had taken plenty of nourishment on the previous day. Neck rigidity and Kernig's sign were less evident, and he could move his head better. The

cerebrospinal fluid was clearer and contained 200 polymorphs, 50 lymphocytes, 0·04 per cent. protein, no pneumococci on film or culture, and 3 mg. of M. & B. 693 per 100 c.cm. The patient had had 6·5 g. of the drug at this stage. A further 4 g. was ordered for that day and 5 g. for the following one, but instructions were given that he should not be disturbed at night, if he was sleeping.

On the 4th his temperature was 99·0° F. and his pulse-rate 72. Headache was now slight, and a further improvement in his condition was noted.

On the 6th his morning temperature had not risen above 99·0° F. for the past forty-eight hours; at night there was a rise to 99·2° F. The headache had disappeared except for a muzzy feeling, which we attributed to the effects of the drug. The paresis of the right external rectus had entirely cleared up, and no signs of meningitis remained except a mild Kernig's sign on the right side. His appetite had returned, and for the previous twenty-four hours he had been taking a normal diet. The cerebrospinal fluid contained 95 polymorphs, 55 lymphocytes, 0·035 per cent. protein, and 2·5 mg. of M. & B. 693 per 100 c.cm. He had now received 19 g. of this drug, and the daily dose had now been dropped to 3·5 g.

On the 8th his morning temperature was normal; on the two previous evenings it had risen to 99·0° F. Sweating was now much less. Apart from the muzzy feeling in his head he felt quite well. He had now received 25·5 g. of M. & B. 693 in all, and it was decided to stop the drug.

On the 10th his temperature had remained normal for the past twenty-four hours. The muzzy feeling in the head had disappeared. A pustular eruption on the upper chest and back and on the neck had appeared on the previous day. The cerebrospinal fluid was now clear and contained 4 polymorphs, 6 lymphocytes, 0·03 per cent. protein, and no trace of M. & B. 693. No abnormal signs were detected on examination of the nervous system.

Convalescence has been uneventful.

COMMENT

As in many pneumococcal cases, the onset of the meningitis was abrupt. Treatment with M. & B. 693 was begun on the third day. At the end of thirty-six hours the temperature had fallen to normal in the morning and remained so, apart from a slight evening rise, for the next three days. The signs of meningitis rapidly cleared up and finally disappeared on the fifth day of treatment after 19 g. of the drug had been given. The changes in the cerebrospinal fluid are shown in the accompanying table, which includes the total amount of M. & B. 693 given before each lumbar puncture. The total amount of M. & B. 693 given was 25·5 g. spread over seven days. The highest concentration of the drug in the cerebrospinal fluid was 3 mg. per 100 c.cm.

CHANGES IN THE CEREBROSPINAL FLUID IN PNEUMOCOCCAL MENINGITIS TREATED WITH M. & B. 693

Day of treatment	Total dose of M. & B. 693	Polymorphs	Lymphocytes	Protein per cent.	Pneumococci	M. & B. 693 per 100 c.cm.
1st	1·5 g.	2800	160	0·045	Present	Trace
2nd	6·5 g.	200	50	0·04	Absent	3·0 mg.
5th	19·0 g.	95	55	0·035	Absent	2·5 mg.
7th	25·5 g.	Drug stopped				
9th	—	4	6	0·03	Absent	No trace

We can trace only three published cases in this country of pneumococcal meningitis treated with M. & B. 693.

In Cunningham's (1938) case, that of a woman, aged 47, who developed meningitis secondary to a frontal sinusitis and was in coma when treatment was begun, 11 g. of the drug was given in the first twenty-four hours. The concentration of the drug in the cerebrospinal fluid reached the high figure of 8·5 mg. per 100 c.cm. The total amount given was 50 g. in seven and a half days. No toxic symptoms were observed.

Reid and Dyke (1938) reported the case of a child, aged 7, to whom 22·5 g. of the drug was given during ten days.

Robertson's (1938) case was that of a boy, aged 14, who was given the large amount of 27 g. in the first seventy-two hours. Neither the total dosage nor the subsequent duration of treatment is given, but the patient developed hæmaturia, which the author attributed to the toxic effect of the drug.

In a series of six cases of meningococcal meningitis treated with M. & B. 693, Hobson and MacQuaide (1938) used doses varying from 25 g. in six days to 90 g. in two months, the latter dose being in a child aged eight months. The daily maximal dose in no case exceeded 6 g. These authors suggest that there may be a considerable individual variation in the capacity to absorb the drug, and that possibly this variation is influenced by gastro-intestinal factors. In their cases the concentration of the drug in the cerebrospinal fluid varied considerably, even though a fairly uniform daily dose of 5–6 g. was given in all cases. In two cases a concentration of not more than 3 mg. per 100 c.cm. provided an effective bacteriostasis.

From the experience gained in our case and from deductions made from the above-mentioned reports, we believe that in an adult of average weight and height large doses of the drug are unnecessary, and that further experience may show that the optimal daily dose is 5–6 g. for the first forty-eight hours, the drug being given four-hourly. It should not be necessary to give the drug at night if the patient is sleeping. This dosage should give a concentration in the cerebrospinal fluid of 3–8 mg. per 100 c.cm.; effective bacteriostasis seems possible with the lower figure. Treatment should be continued for three or four days after the temperature drops, the dose being gradually decreased. A total amount of 20–30 g. should suffice in the average case.

Before the introduction of M. & B. 693 the mortality from pneumococcal meningitis was about 100 per cent. The introduction of this drug has entirely altered the outlook in this type of meningitis, just as sulphanilamide has done in meningococcal and streptococcal infections (Banks 1938). Further experience will probably show that, as in meningococcal meningitis, the effect of the drug is greatest during the early stages of the disease, and that failures will be met with when the diagnosis has not been made early enough or the administration of the drug has been delayed. In the cases so far treated successfully with this drug the shortest period between the onset of the illness and the first dose of M. & B. 693 was forty-eight hours, and the longest period seventy-two hours. It is therefore essential that, to keep the mortality low, practitioners should recognise the earliest signs of meningitis. In a suspected case treatment should not be delayed until the results of the examination of the cerebrospinal fluid are available. M. & B. 693 has been shown to be effective against the meningococcus, streptococcus, and pneumococcus (Whitby 1938), and these are the causal organisms in over 90 per cent. of cases of pyogenic meningitis. Hobson and MacQuaide (1938) have had good clinical results with M. & B. 693 in meningococcal meningitis. The empirical use of M. & B. 693 in all forms of acute meningitis is therefore justifiable, but a bacteriological examination

of the spinal fluid at the earliest opportunity is important for rational treatment and for prognosis.

One of the advantages foreshadowed by chemotherapy of the pyogenic forms of meningitis is the avoidance of daily lumbar puncture and drainage of cerebrospinal fluid (Banks 1938). In the present case it was performed on only four occasions, and no attempt was made to draw off large amounts of fluid. It seems desirable to avoid drainage, because the presence of the drug in the fluid enables it to exert a bacteriostatic effect on the organisms in the meninges, choroid plexuses, and cerebrospinal fluid. In children it is possible that repeated lumbar puncture and drainage of cerebrospinal fluid may be factors in promoting adhesions round the lower brain-stem and subsequent chronic hydrocephalus. Lumbar puncture should therefore be performed only initially to establish the diagnosis and subsequently at intervals of two or three days to ascertain the effect of the drug on the organism and cell count and, when possible, the estimation of the amount of M. & B. 693 excreted into the cerebrospinal fluid.

We wish to thank Dr. L. E. H. Whitby for kindly performing the pathological investigations and for advice concerning dosage.

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STAPHYLOCOCCAL SEPTICÆMIA TREATED WITH M. & B. 693

REPORT OF A CASE

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In view of the lack of positive evidence as to the efficacy of M. & B. 693 in staphylococcal infections, the following case seems worthy of record.

A man of 34, a cotton operative, was admitted to the Manchester Royal Infirmary under Dr. T. H. Oliver on Jan. 12, 1939. In November, 1938, he had an attack of pleurisy with cough, from which he made a good recovery. In December he developed a boil on his right buttock, which was fomented and incised by his doctor, the wound healing within a week, but he began to complain of weakness and general malaise, loss of appetite and frequent attacks of sweating about this time. These attacks became worse and were accompanied by progressive pallor, insomnia and loss of weight, and he was admitted to the infirmary as an urgent case. There was nothing of note in his previous medical history.

On admission he was pale and toxic, with a dry, coated tongue. His pulse was 136 and regular, his temperature 102° F., and respiration 24. His urine was acid and contained albumin. The abdomen moved well on respiration, and there was some general fullness with generalised voluntary resistance to palpation but no actual tenderness or rigidity. The spleen was enlarged to two finger-breadths below the left costal margin. The liver and kidneys were not palpable, and there was no tenderness or resistance in either renal angle. Rectal examination revealed no abnormality. There was a firm, well-healed, recent scar on the right buttock, which was neither tender nor inflamed. The heart was not enlarged, and there were no murmurs. His blood-pressure was 140/90. Chest movement was equal and good, but there was diminished air-entry at the right base, with generalised medium-pitched rhonchi and râles. Examination of the central nervous system was negative.

A diagnosis of septicæmia was made, and the following investigations performed. Blood-count: red cells, 4,670,000; Hb., 82 per cent.; colour-index, 0·87; white cells, 12,200 (polymorphs 83·5 per cent.). Agglutination reactions: no agglutination in dilution of 1 in 20 with *B. typhosus* (H and O); *B. paratyphosus* A and B (H); *B. aertrycke* (O); *Br. abortus*; Flexner's bacillus V, W, X, Y and Z; or Sonne's bacillus. Fæces culture yielded a growth of the normal fæcal flora. Sputum: cultures yielded a growth of mixed organisms with predominance of *Streptococcus viridans*; no tubercle bacilli seen; sputum was non-purulent in type. Urine: centrifuged deposit contained some epithelial cells and pus cells; films showed a few gram-positive cocci; cultures yielded a slight growth of *Staphylococcus albus* (coagulase negative). Blood-culture: growth of *Staph. pyogenes* (approximately 20 per c.cm.), coagulase positive, occurred after two days' incubation.

Progress.—The diagnosis was thus established, and 1 g. Uleron (Bayer) t.d.s. was given by mouth on Jan. 19 and for four days, without any response. The patient's general condition deteriorated, and his temperature rose on one occasion to 104° F. Blood-culture was repeated and returned positive on Jan. 22. The albuminuria greatly increased, and owing to his very poor condition a blood-transfusion of 500 c.cm. was given on Jan. 26 with some slight improvement. Three days afterwards his temperature began to rise again; fever was intermittent, with profuse sweating and a maximum of 104° F. (see chart). M. & B. 693, 1 g. four times a day, was begun on Jan. 27. His temperature rapidly fell and remained normal for seven days. The drug was tolerated very well apart from a little vomiting during the first three days. M. & B. 693 was continued until Feb. 3, during which time repeated blood-culture was negative. His general condition improved considerably but gradually became worse during the seventy-two hours after the drug was stopped, with a rise of temperature to 103° F. on Feb. 7. M. & B. 693 was recommenced on Feb. 7, using a dosage of 1 g. t.d.s., and was finally discontinued on Feb. 18. The last blood-culture, taken on Feb. 22, was returned negative after seven days' incubation, and he has made a complete recovery. The last blood-count, done on Feb. 10, showed: red cells, 4,260,000; Hb., 75 per cent.; colour-index, 0·87; white cells, 8400 (polymorphs 67·5 per cent., lymphocytes 28·5 per cent.). He is receiving full doses of ferrous sulphate by mouth to bring the hæmoglobin up to normal. The spleen is no longer palpable, and at no time was there evidence of any gross septic focus, such as a perinephric abscess. He looks and feels perfectly well.

I am indebted to Dr. Oliver for permission to publish this case, and to Dr. R. W. Fairbrother and the staff of the clinical laboratory of the Manchester Royal Infirmary for their coöperation.

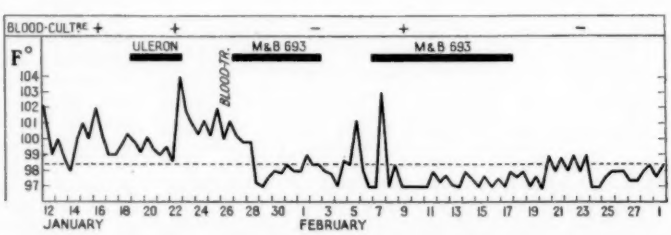


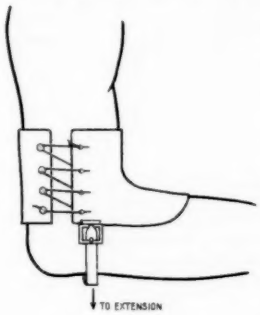
Chart showing fall of temperature during administration of M. & B. 693.

CLINICAL AND LABORATORY NOTES

A SIMPLE METHOD OF APPLYING EXTENSION TO THE ELBOW

BY T. A. BUTCHER, M.D. Camb.

IN cases of fracture of the humerus with injury to the skin of the lower part of the arm and elbow difficulty may be experienced in applying extension because of the impossibility of fixing adhesive strapping to the skin, or the inadvisability of using a transfixing pin or wire when there is local sepsis. The following method overcomes this difficulty effectively.



The arm is put up in the usual way on a Böhler abduction splint made of metal or plaster-of-paris. An ordinary spat, intended for the foot of the same side as the fracture, is then put on the elbow in exactly the same way as it would be on the ankle (see diagram). If the spat will not quite encircle the limb, as is likely to happen when thick dressings are required, it can be done up effectually by threading a bootlace or string through the button-holes and round the buttons. Extension is applied to the strap which ordinarily passes under the shoe. In some cases this strap may need lengthening. When the wound is being dressed extension may be maintained by an assistant holding the forearm.

This method may appear rather rough and ready, but I have found it entirely satisfactory in practice.

ACUTE TRANS-DIAPHRAGMATIC PROLAPSE OF VISCERA

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THE following notes epitomise the clinical features of acute strangulated diaphragmatic hernia.

CASE-RECORD

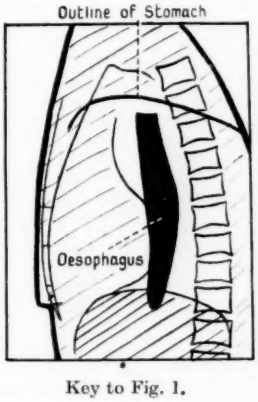
A multipara, aged 68, was admitted to the Cumberland Infirmary on Dec. 29, 1935. She was a moderately plump woman of fairly good colour and sat up in bed, breathing with some distress, with a respiration-rate of 36–50, a pulse-rate of 120, and a temperature of 99° F.

Fifty hours before admission she was straining at stool, when suddenly she developed severe cramps about the navel and breathlessness. Retching ensued rapidly and had been continuous; the pains radiated up the sternum from the abdomen. Attempts at vomiting produced rhythmic pains below the left costal margin. Flatus and stools had not been passed, and any fluid taken by mouth was returned unchanged within a minute or two. Thirst was distressing. Pain in the tip of the left shoulder had been present for about twenty-four hours. There was a short recurrent cough, not troublesome. Morphine had been given by the patient's doctor for the past two nights and allowed some respite from distress. Ten hours before admission an enema was given but produced no fæcal or gaseous result.

Forty-five years previously, at the age of 23, the patient had been crushed by a marble slab, which fell across the upper abdomen. Since then she had complained of "windy indigestion." There had been no illnesses and no operations.

FIG. 1—Lateral radiogram of diaphragmatic hernia.

Bedside examination indicated that stomach and probably part of the large bowel were inside the left hemithorax. Breathing was noticeably rapid but short of actual dyspnœa, which allowed the patient to be fairly pink though it forced her to sit up in bed. The clean moist tongue suggested that vomiting had not been copious. The apex-beat was displaced medially, being seen and felt just below the xiphisternum. There was hyper-resonance on percussing the left chest, together with absent vocal resonance and absent breath-sounds; these are the signs of pneumothorax. Only the pulmonary apices conducted breath-sounds; the lung bases were level on percussion. The abdomen was not distended but was tender above the navel.

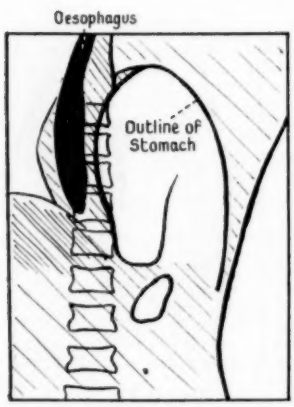


Key to Fig. 1.

Radiography.—The patient was radiographed after swallowing a few mouthfuls of dilute barium emulsion. Figs. 1 and 2 illustrate the findings. The trachea, mediastinum, and heart were displaced to the right by the enormously inflated stomach, which occupied the lower three-quarters of the left pleural cavity. The right dome of the diaphragm moved well on respiration. The œsophagus was kinked and partially occluded at its lower end. The left costophrenic angle was clear; a large gas bubble below the normal level of the left dome of the diaphragm indicated large bowel, possibly obstructed there.

Operation took one hour. The œsophagus was washed clear of residual barium; then intratracheal ether was delivered by a positive-pressure apparatus. With the patient in the right lateral position, the eighth rib was subperiosteally resected from angle to costal cartilage; when the pleura was opened a small quantity of clear fluid escaped and the bulging stomach presented. The hand could not be introduced into the chest because of the tension, so a small trocar and cannula was inserted into the stomach and its contents evacuated. Over a pint of fluid escaped in jets synchronous with the heart-beats. This made it possible to examine the inside of the chest and to palpate a hole in the diaphragm, whose edges were well organised, white, and smooth. The aperture was situated halfway between the mid-axillary and nipple lines, with its outer edge about 1 in. from the chest wall. Since it was not tightly filled with herniating stomach, three fingers could be passed down into the abdomen. Besides the stomach a large loop of collapsed transverse colon and some omentum could be seen above the diaphragm.

FIG. 2—Anteroposterior radiogram of diaphragmatic hernia.



Key to Fig. 2.

On replacing the contents in the abdomen, two omental adhesions presented, one to the edge of the diaphragmatic hole and one, a thin slip of fatty omentum, to the pericardial aspect of the pleura. They were both well organised and bled from both ends when torn across.

The gap in the diaphragm was closed without tension, with two rows of catgut sutures. The chest wall was closed in layers after an unsuccessful attempt to expand the lung.

The patient withstood operation well and was more comfortable next day, and there was no vomiting. Her improvement, however, did not continue; she became worse on the second and died on the third day after operation.

Post-mortem examination showed that the left lung had re-expanded and filled up three-quarters of the left chest. There was no pleurisy. The hole in the diaphragm was closed, and adhesions had begun to form. No peritonitis was evident. The pancreas showed acute hæmorrhagic necrosis. There was no evidence of calculi in the biliary tract. The cause of the pancreatitis must have been the trauma of the operation.

The history of the old injury cannot be neglected; despite the long latent period it was undoubtedly the predisposing factor. The omental adhesions bear witness to the temporary patching of a tear in the diaphragm. However, a sudden rise in intra-abdominal pressure forty-five years later produced a diaphragmatic hernia.

SUMMARY

(1) A case is described in which the left dome of the diaphragm was ruptured and then repaired spontaneously. (2) After a latent period of forty-five years the old wound gave way, producing an acute diaphragmatic hernia. (3) Death from acute hæmorrhagic pancreatitis took place on the third day after operation.

I am indebted to Mr. A. J. Caird for permission and guidance in preparing this report; to Dr. J. S. Faulds for the post-mortem report; and to Dr. R. Connell for the radiographic findings.

THE LANCET 100 YEARS AGO

March 30, 1839, *p.* 50.

From a leading article.

Speculative researches, and isolated facts are prosecuted most successfully by individuals. The discoverer sees a truth that others cannot see; and as it is impossible for a Government to decide whether the imagined new principle is a vague, baseless vision, before it is brought within the range of demonstration, no good ever results from the bestowal of public money on projectors, inventors, or presumed discoverers. When successful they should be rewarded, but no government has a right to grant them public money, either to undertake, carry out, or complete inventions, as 99 in 100 new projects prove to be moonshine, and the real discoverer is too confident, too ardent, and too much enamoured of Truth, not to follow her, in the midst of difficulties and obstacles, to the end of the world. NEWTON would never have applied to the minister for a sum of money to enable him to demonstrate the universality of the law of gravitation; and if he had applied, probably he would not have been successful, because the minister might have doubted of the existence of the law of gravitation, or of its importance, or of NEWTON'S powers of realising the ideas with which he was impressed, which may not have been remarkably intelligible in their crude state to the mind of a Prime Minister.

There are, however, several departments of inquiry, of decided and acknowledged utility, which private individuals have it rarely in their power to pursue. This is the case in natural history, where specimens have to be collected at great expense, in different parts of the globe. ARISTOTLE would not have succeeded so admirably in his zoology, if he had not received assistance from ALEXANDER. . . . Statistics, again, can only be cultivated to a limited extent by individuals; a fortune would scarcely enable a statist to obtain a census of the population, nor would the country submit to the experiment, or consent to make the returns, although all are equally interested in knowing whether the resources and population are decaying or increasing.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF EPIDEMIOLOGY

AT a meeting of this section held on March 24 the chair was taken by Dr. J. D. ROLLESTON, vice-president, and Dr. E. R. CULLINAN read a paper on the

Epidemiology of Jaundice

The two forms of infective jaundice seen in this country, he said, were Weil's disease and common infective jaundice. The former had been defined by Weil in 1886 and was still relatively uncommon. Less than 200 cases had been reported in Great Britain. Human cases could almost always be traced to rats and the organism entered through cuts and sodden skin, and perhaps conjunctivæ and the upper respiratory tract. Early diagnosis was essential as the antiserum was most valuable in the first stage. There were mild infections without jaundice, with fever and malaise, and the condition should be suspected if the occupation brought the patient into contact with rats.

Common infective, or catarrhal, jaundice was widespread; apparently sporadic cases were seen. Its cause was unknown. In the last twelve years there had been 1707 reported outbreaks, widely scattered over the country. The disease was not confined to rural areas, but was more easily seen and traced in villages. Infectivity was low and incubation long. Children of 6–10 years were peculiarly susceptible. About one-fifth of the cases in most epidemics were in adults, but they seemed to have more immunity than children though their symptoms were more severe. If there was any doubt, Weil's disease should be excluded. There was often a prodromal period of lassitude and malaise and a sharp febrile onset—usually described as "a chill"—without rigor. Early headache, loss of appetite, abdominal pain and nausea were common, and vomiting often severe and intractable. Jaundice appeared in anything up to twelve days after the onset, first in the conjunctivæ and then in the face and neck. Its appearance usually heralded the beginning of convalescence. In severe cases it might last three weeks or longer. In adults the liver might be three finger-breadths below the costal margin. The gall-bladder had been said to be palpable in some cases. The urine might be dark with bile pigments one or two days before the onset of jaundice. If 0·1 mg. of histamine was injected and a piece of glass pressed firmly over the resulting weal, one van den Bergh unit (or more) of bilirubin in the blood would be revealed by a yellow colour in the centre of the weal. The eye could not detect less than four units. There might be acetonuria and urticaria. There was relative or absolute increase in lymphocytes or monocytes, or both, but no leucocytosis. The stools were usually clay-coloured at some time, but often contained bile during the period of jaundice. Sore-throat was rare and incidental. Convalescence lasted from one to three weeks. The disease was usually mild, especially among children. Occasionally it recurred. Complications were very rare: parotitis and oöphoritis had been recorded.

The disease spread from person to person, and not by water, milk, or food. The family and dormitory spread suggested droplet infection. The infectivity was only high when contact was close. The period of incubation was difficult to assess, but approximated to 21–35 days. Some believed there were two forms of the disease, with different incubation periods. People were infectious before they were jaundiced but the period of infectiousness was short. Children could go to school after two weeks and adults might be admitted to general wards when jaundice had appeared. Atypical missed cases, carrier-spread, and low infectivity accounted for apparent sporadic and endemic cases. The pathological process was probably necrosis of liver cells, but fatal cases were very rare. Some maintained that two different clinical pictures were often seen in epidemics: a primary hepatic necrosis type and an obstruction type. There did not seem enough evidence to justify this subdivision. Epidemic jaundice in Sweden seemed to have taken the form of acute necrosis of the liver. Subacute necrosis unassociated with any drug or toxin was by no means unknown in this country. The bile epithelium was seldom destroyed and there was no evidence of obstruction or inflammation of the bile-ducts. The similarity between these cases and common infective jaundice suggested a common cause. Jaundice cases observed in a diabetic clinic resembled common infective jaundice, except that the jaundice persisted for 31–90 days. Syphilis and arsenical preparations rendered the liver more susceptible to damage. Many of the cases in syphilitics occurred in epidemics irrespective of the dose and method of administering the drug. Common infective jaundice had also followed the injection of normal human serum; possibly a hepatotoxic agent was introduced and predisposed to, but did not cause, a subsequent attack of the disease.

The CHAIRMAN said he was particularly interested in the spirochætal jaundice found increasingly in sewer-workers, fish-curers, and miners, which might assume many different forms. Holland had suffered much from the disease, infection having taken place in swimming-baths. The question arose whether active prophylaxis should not be instituted on a large scale. Fatal jaundice following injection of convalescent serum had caused public-health authorities much anxiety.

Dr. J. L. NEWMAN spoke of the recent West Sussex epidemic which had spread widely in quite unconnected places since an endemic focus had been discovered in Arundel in July, 1937. Some 360 cases had been traced. There had been peaks in November and January. One epidemic had been confined to a row of council houses a little way outside a village; another had been almost confined to school-children. The school spread had been over-stressed. Thirty-nine schools had been involved in Sussex and twenty of them had had 3 cases or less. In only four had there been more than 20 cases. The child population was more susceptible than the adult population. Often direct contact had not been established. The clinical features had varied enormously. In three schools absences for bilious attacks had been abnormally frequent before the epidemic of jaundice.

Major H. C. BROWN reported absolute failure to find any leptospiral infection in the Northamptonshire and Oxford outbreaks. In the former, conjunctivitis had been extremely common. He had never felt satisfied with the subdivision into two types. The jaundice following use of measles serum showed none of the pathological features of Weil's disease in the case he had examined; moreover, this child had shown 60 per cent. of mononuclears. Villages in Northampton infected one year seemed to escape in the following year. Florid cases showed all the

symptoms of Weil's disease and were clinically indistinguishable, except by the intense muscular pain of Weil's disease.

Dr. J. ALISON GLOVER described three school epidemics. The first one had shown a mass outbreak which could only be due to droplet infection. The explosive picture presented was that of a short incubation period. There was also a type of long-period infective jaundice. The chart of the Post Office outbreak looked like a low-grade droplet infection with quite a short incubation period. Tonsillitis or sore-throat occurred in nearly all cases in some epidemics and were almost completely absent in others. Jaundice was a complication of scarlet fever; in four cases in one epidemic the hands had peeled. One American outbreak had been associated with salmonella gastro-enteritis and seemed to have been due to water. In one case there had been a serious intestinal hæmorrhage.

Dr. J. M. ALSTON, speaking of prophylaxis of Weil's disease, said that inoculation did not seem very successful. There were severe reactions, and it did not seem to produce many antibodies. The incidence of Weil's disease in London sewer-workers was 1 per cent. per annum; so it did not seem worth inoculating them. The fish-curing type could probably be prevented by keeping the houses cleaner and so free from rats.

Dr. W. N. PICKLES expressed his complete accord with Dr. Cullinan. Cases of hepatic necrosis appeared in mild epidemics and seemed to have a common ætiology and incubation period. Close contact—e.g., sharing a bed—seemed to be necessary in the majority of cases. He asked if permanent damage were done to the liver.

Dr. G. M. FINDLAY thought the infective agent was a virus. At one time, working on yellow fever, 95 cases of jaundice had been traced in 3100 persons inoculated by tissue-culture methods. The hepatitis had been completely cut out by changing the strain of yellow-fever virus, although another 3000 persons had been inoculated. The infective agent had shown all the characteristics of a filtrable virus. When a virus was inoculated by an unusual route, the incubation period was often prolonged. Jaundice after measles inoculation was very like that after yellow-fever inoculation and the disease could be passed on to non-inoculated children. No laboratory animal had hitherto been found susceptible, but there was now a hope that rhesus monkeys would take it, by inoculation directly into the stomach.

Dr. J. W. HEALY spoke of epidemic jaundice among L.C.C. school-children. From November, 1937, to February, 1939, 193 cases had been notified but some of the data were secondhand and retrospective. Many mild cases must have been missed. The most obvious grouping was by schools, the largest group being 24 cases in a Millwall school. The commonest early symptoms had been drowsiness, headache, and vomiting. In 90 per cent. of cases jaundice appeared between one and eight days after the onset of symptoms. The period of absence from school varied from one week to three months.

Dr. CULLINAN, in reply, said he had been unable to obtain any striking reports of recurrences, but the second attack seemed to be worse than the first. On the whole, very few cases of tonsillitis had been described. He very much doubted whether in the ordinary case any permanent damage was done to the liver, but if subacute necrosis were a related condition, and if it recurred, the liver might get damaged.

SECTION OF DISEASE IN CHILDREN

AT a meeting of this section held on March 24, with Dr. E. A. COCKAYNE, the president, in the chair, Prof. ROBERT DEBRÉ of Paris gave an address on

Familial Hepatitis and Chronic Jaundice

Prof. Debré said that the customary search for inflammations and intoxications, such as syphilis, tuberculosis, or alcohol, could not account for cases in the first month of life, and when successive members of a family were attacked, the suggestion arose of a hereditary origin. He described a family of six children, of whom three had died of hepatic cirrhosis, a fourth though affected still surviving. The first and the fifth child were normal. The second, a boy, died at 8 months of cirrhosis. The third, a girl, was first seen at the age of 4 when she had hard enlargement of liver and spleen, clubbed fingers, slight deafness, and chronic jaundice with bile retention. When she was 9 her growth was so retarded that she looked only 6. At this time she had hæmorrhage from the gums and died of pneumonia. The fourth child, a girl, when first seen aged 1 year, had been jaundiced for two weeks at 2 months, and from the age of 6 months passed pale stools and dark urine. The liver was hard and smooth and extended to the iliac spine. She died of hæmorrhage at 10. The sixth, a boy, had spontaneous epistaxis, dark urine and pruritus when he was 3, and since then a large liver and spleen. Jaundice persisted in varying intensity for 5 years. There was no ascites. These were undoubted cases of biliary cirrhosis of familial type. Some thirty families were on record, many in the French, most in the British literature. In more than half there were 2 cases in a family, in some 3 or 4. In one family 2 mongols were affected. In three families 2 generations were involved. In each case in a family the history of onset of symptoms was strikingly similar. The disease was rare in France and Germany, less so in Britain and the United States, known in Spain and Italy, and commonest in India and Mexico. Cases could be grouped into three divisions: (1) those of the type of Laennec's cirrhosis, with a large abdomen, large liver, and evidence of portal obstruction; (2) those with large liver and spleen, and hæmorrhage, but without ascites or icterus, reminiscent of Banti's disease; (3) the commonest type, those with biliary cirrhosis, pronounced jaundice, increased bile pigments and salts in blood and urine, colourless stools as a rule, large, firm and smooth liver and spleen, and at a late stage ascites and hæmorrhage. Retardation of growth in weight and height were constant, and sexual development delayed, while mental progress was slow. The course of the disease could be slow or rapid, the onset early in life or late. It was possible that some cases of hepatic cirrhosis in adults were of hereditary origin. Pathological studies, which were rare, showed that the normal structure of the liver was completely destroyed, the lobules being separated by masses of fibrous tissue, the bile-ducts remaining normal; the staining power of the nuclei of the hepatic cells was lost. Certain other liver diseases had to be differentiated from this condition. The dyslipoidic conditions of Niemann-Pick, Gaucher, and Tay-Sachs had their own special features. In Gaucher's disease the spleen was relatively more enlarged than the liver, hæmorrhages were common, there were bone and lymph-node changes, and the colour was due to pigmentation of the type of hæmochromatosis. In familial hæmolytic jaundice the clinical course and the large spleen with relatively

small liver made distinction easy. Another familial group with large abdomen, large liver, and dwarfism, but without splenomegaly, ascites, icterus or hæmorrhage was that described by von Gierke. Here glycogen and lipoid metabolism was markedly disturbed; the disease belonged to the polycoric cirrhoses, a term coined by Prof. Debré to describe pathological accumulation of substances in the liver. Hepatic cirrhosis with bone and corneal changes had been reported. One curious type, subacute hepatic necrosis, was said to follow epidemic catarrhal jaundice, a possibility Prof. Debré was reluctant to accept.

Other hereditary and familial diseases were associated with hepatic cirrhosis. Congenital deformity of the extrahepatic biliary system was found in some cases of neonatal obstructive cirrhosis. Vitamin-lack, excessive carbohydrate or spices, congenital syphilis, and some congenital factor had been invoked to explain the cases of familial hepatic cirrhosis in Indians and Mexicans. In the hepatolenticular degeneration of Wilson, liver, brain and cornea were involved. Osler and others had suggested that this degeneration might well be closely associated with familial hepatitis. One form of Laennec's cirrhosis was associated with telangiectasis and hæmangiomatosis. In conclusion Prof. Debré noted analogies between familial hepatitis and renal dwarfism, where a progressive fibrosis was found, sometimes with abnormalities of the excretory channels. Was it not possible that in all these cases a defect of the trophic centres produced a progressive fibrosis leading inevitably to death? The cause would be in the genes, and the study of these conditions should be enlarged to include close attention to their genetic aspects.

The PRESIDENT suggested that the disease was inherited as a recessive, in the same way as Wilson's disease. If this were so, consanguinity of parents should be demonstrable.—Dr. F. PARKES WEBER mentioned his personal debt to France for help in understanding his own cases.—Dr. B. SCHLESINGER asked for an explanation of the dwarfism and the clubbing.—Dr. J. LEVY reported positive formol-gel tests with serum from cirrhosis cases.—Dr. W. W. PAYNE had the same experience, but the test was not so strongly positive as in kala-azar.—Dr. R. C. JEWESBURY expressed interest in the fact that two mongols had been affected.

MEDICAL SOCIETY OF LONDON

AT a meeting of this society on March 27 the chair was taken by Dr. C. E. LAKIN, the president, and a discussion on the

Ocular Manifestations of General Disease

was opened by Prof. EDWIN BRAMWELL. Speaking particularly of the significance of certain derangements of the ocular musculature, he said that the eye was the paramount organ of silent expression, and the motor phenomena which constituted expression could give important information about the state of health and mind, the temperament, and the attitude towards the self and the environment. Sleeping with the eyes half-open in a seriously ill patient had grave significance. Tremor or flicker of the eyelids indicated an anxious temperament or temporary anxiety. Flicker, which was pronounced in "traumatic neurasthenia," could not be effectively simulated. It might be accompanied by other signs of emotional disturbance and might be similarly produced. It did not occur in exophthalmic or toxic goitre. Excessive blinking might be due to emotional causes. Diminution in the rate of blinking was a striking feature of some cases of parkinsonism and might be a valuable sign in the early stages. It was also frequent in exophthalmic goitre, even in the absence of exophthalmos. A tic was often the sequel of blepharospasm. It might develop from a mannerism, but was essentially a manifestation of something defective in the mentality—irresolution or want of perseverance. Temporary blurring of vision, apparently due to a paresis of accommodation, was fairly common in acute lethargic or epidemic encephalitis. Transient diplopia was more often due to an encephalitis than to any other cause, but defective convergence was perhaps the most frequent ocular manifestation. Loss of upward movement of the eyes was not uncommon, but when it was the only sign the diagnosis lay between encephalitis and a midbrain tumour. Oscillation of the eyeballs when the eyes came to rest after lateral deviation was sometimes observed in chronic encephalitis and in tuberculous meningitis. Oculogyral crises were pathognomonic of chronic encephalitis; the movements resembled those of tic, especially in being exaggerated by emotion.

Syphilis was an especially frequent cause of peripheral ocular palsy, but its incidence in this connexion had been exaggerated. Localised extrinsic pressure, in association perhaps with some general factor, was the determining cause in the great majority of unilateral cerebral or spinal nerve palsies. Predisposition to pressure depending on particular anatomical relationships chiefly explained the frequency of some peripheral nerve palsies and the rarity of others. An isolated third-nerve paralysis was due in probably the great majority of cases to the leakage of an aneurysm at about the point where the carotid artery joined the circle of Willis. A leaking aneurysm at this site caused a characteristic syndrome: sudden severe headache localised to the back of the orbit or the corresponding side of the forehead in a previously healthy person; vomiting, vertigo, and sometimes drowsiness; rigidity of the neck and perhaps Kernig's sign; the presence of blood in the cerebrospinal fluid; and a third-nerve paralysis or paresis. The diagnosis might be confirmed by arterial radiography. Ocular palsies were common in myasthenia gravis and were characterised by variability in their distribution and degree and the ease with which the muscles became exhausted.

The Argyll Robertson pupil had been associated by its discoverer with myosis, but only because the four patients in whom he first observed it had all been referred to him as sufferers from myosis. Tonic pupil differed from Argyll Robertson pupil in being found especially in young people and in females. It was often unilateral and usually dilated. It was immobile to light and contracted on accommodation and convergence very slowly and often extremely, the subsequent dilatation being correspondingly sluggish. It was not a manifestation of syphilis. Some or all of the reflexes might be lost and tabes might be erroneously diagnosed. It was a benign disorder, for it was not disabling and had no other symptoms. Miner's nystagmus was not a physical disease nor disabling in itself, but was a sign of anxiety neurosis due to the danger of mining. Much unnecessary disability and expenditure of compensation was due to the failure to recognise this simple fact.

Mr. R. FOSTER MOORE said that for detecting proptosis he relied on direct observation, standing behind the patient and tilting his head back until the

eyeballs were visible under the brows. He could easily and accurately detect which eye was the more prominent. Undue prominence or recession might be simulated by retraction of an upper lid or by the sinking of the normal eye into the head, leaving the affected eye apparently normal. The exact negative of the condition was seen in sympathetic paralysis, in which the lid was dropped and the patient complained that the eye was sinking into the head or that the normal eye was getting large. There was no sinking-in of the eye in enophthalmos, but the appearance was produced by the dropping of the upper lid. The proptosis of Graves's disease was not due to stimulation of sympathetic nerves but consisted in the spontaneous development of retraction of an upper lid. Such retraction was never caused by anything else except injury. It might allow the eye to be injured through undue exposure to trauma or infection. The exophthalmos never entirely disappeared after cure. He believed the cause to be an increase of orbital fat, combined with œdema of the tissues. The proptosis did not develop suddenly but might be noticed suddenly. He had relieved the condition by incising the conjunctiva and removing portions of the fat, suturing the lids until healing was complete.

The presence of even one small hæmorrhage in the retina was evidence of disease. Hæmorrhages differed largely according to the disease which caused them. They produced few and slight subjective symptoms unless they involved the macula. They might, however, be associated with other changes, such as renal retinitis, which caused serious impairment of vision. The affected area of the retina did not change colour like a healing bruise of the skin, but faded away without trace. Even a large hæmorrhage which persisted for many months was not associated with pigmentary change. The immediate cause of the extravasation might be purely physical—e.g., the pressure undergone by an infant at birth, and that of papillœdema or central vein thrombosis. The fundus of a dying patient showed whiteness of the disc, great reduction in the size of the arteries, breaking-up of the blood column in the veins into small blocks which swung to and fro, and cessation of movement. About ten minutes after death the cornea became opaque. Hæmorrhage might also be due to changes in the blood or the endothelium. Probably no patient died of leukæmia or pernicious anæmia without retinal hæmorrhage.

The pressure in the retinal vessels in arteriosclerosis might be lower than normal, even though the systolic pressure was high; the hæmorrhages were therefore perhaps due to a fault in the endothelium. The distinctive flame-shaped hæmorrhage was due to blood escaping into the nerve-fibre layer and showing up its striated texture. In diabetes the hæmorrhages took place in the deeper layers and showed up their retiform structure. Diamond-shaped hæmorrhages with pale centres strongly suggested a blood disease. They looked like an endothelial cell with its nucleus. They might represent an escape first of all of blood elements and later, when the leak between the endothelial cells closed, of plasma and platelets only, until the hole was stopped. The condition of the retinal vessels in vascular disease was a clear and accessible indication of the condition of cerebral vessels of the same size. The most conspicuous evidence was to be found where the arteries crossed over the veins: they would turn and run beside the vein for a short distance on each side. This was the surest sign of arteriosclerosis. The calibre of the artery might be reduced at various points. This reduction was often accompanied by subjective visual symptoms clearly referable to the precarious supply of blood. The arteries also took on a "copper-wire" appearance, but this was only an exaggeration of the normal brightly polished appearance. Hæmorrhages were mostly of the flame type and showed an advanced stage of the disease.

DR. ANTHONY FEILING, dealing with the optic nerve, said that the term papillœdema should be reserved for cases showing œdema of the optic discs or papillæ without signs of generalised change in the retina. Swelling of the disc might be found in cases of true inflammation of the optic nerve. When it affected the intra-ocular portion it was termed papillitis; when the retro-ocular part, retrobulbar neuritis. These cases, however, formed a very small proportion of the cases of true papillœdema, which was principally found in states of increased intracranial tension. It was generally believed that increase of pressure of the cerebrospinal fluid in the cerebral subarachnoid space led to obstruction in the venous and probably also the lymphatic drainage of the optic nerve. The causes were intracranial tumours, cerebral abscess, encephalitis and meningitis, hydrocephalus, syphilis, cerebral sinus thrombosis, subarachnoid hæmorrhage, and hyperpiesia. Intracranial tumours were the most important single cause of papillœdema. Subtentorial tumours, particularly tumours of the cerebellum, tended to produce an early and severe papillœdema, as did tumours which blocked the sylvian aqueduct or the fourth ventricle. Papillœdema often appeared late in the growth of a tumour of the acoustic nerve. It tended to be well marked in tumours of the temporosphenoidal lobe and in most tumours of the frontal and parieto-occipital lobes. It appeared late in tumours affecting the vertex or the centrum ovale. In tumours of the pons it was often entirely absent. The larger the tumour the greater the probability of a papillœdema, and the rate of its development depended on the rate of growth of the tumour.

Papillœdema was, on the other hand, not rarely the presenting symptom in cases of cerebral tumour, which was usually subtentorial or at least in a silent region of the hemisphere, such as the frontal or temporosphenoidal lobe, especially on the right side; or within the ventricle. Unless the difference between the œdema of the two sides was very noticeable and measurable in diopters, its localising value was doubtful. Ample vision might be retained, but sooner or later secondary atrophy of the nerve-fibres would take place. The earliest change might be a simple enlargement of the blind spot, followed by a concentric contraction of the visual fields. Once loss of vision began it was apt to increase rapidly and lead to permanent blindness, even after the tumour had been removed. Some authorities said that unilateral papillœdema was more likely to be found in association with abscess than with tumour. Papillœdema was exceedingly rare in the non-suppurative forms of encephalitis and was much less common than might be supposed in meningitis. When meningococcal meningitis had produced a severe internal hydrocephalus, optic atrophy was commoner than papillœdema. Internal hydrocephalus might, however, produce papillœdema at a rate corresponding to its development. An acute form was now recognised under the designation of toxic or otitic hydrocephalus, formerly known as serous meningitis. In many cases in which the picture was simply one of intracranial hydrocephalus there might be some form of intraventricular tumour; ventriculography here had great diagnostic value.

In hyperpiesia papillœdema was rarely unaccompanied by other changes in the retina, but it sometimes appeared in that condition which was now generally termed hypertensive encephalopathy and arose in the malignant form of hypertension. Temporary papillœdema might occur in certain forms of renal disease or prerenal toxæmia, such as the toxæmic kidney of pregnancy, or in lead-poisoning. In neuromyelitis optica a true papillœdema of low degree might be associated with gross loss of vision, though in this condition a retrobulbar neuritis without swelling of the discs was commoner. Dr. Feiling dealt also with optic atrophy.

Mr. WILLIAM IBBOTSON asked the cause of a papillœdema persisting after successful removal of an extradural abscess in a boy aged 12; and of paralysis of the external rectus of the same side as a mastoid drainage, lasting for six months and completely clearing up.

The PRESIDENT asked why so many patients came to the general physician saying that the ophthalmologist had assured them that they had nothing wrong with their eyes but that their sight would improve with their general health. He wondered what the specialist really meant by that statement.

Mr. F. A. WILLIAMSON-NOBLE said that the signs of retinal arteriosclerosis were sometimes very difficult to discover with the ophthalmoscope. Irregularity of the calibre of the arteries was very difficult to see. In preparing drawings of retinal appearances every ophthalmologist seemed to put into every case the signs which particularly appealed to him. Papillœdema was sometimes superimposed upon an optic atrophy, possibly through blocking of the narrow chink in the subdural space leading through the optic foramen, in such a way that the increased pressure could not be transmitted down the channel through which the nerve ran.

Dr. G. E. S. WARD spoke of an elderly gentleman who had enjoyed excellent general health in spite of a continuing systolic pressure of 240 and occasional strokes. A retinal hæmorrhage had deprived him of most of the vision of his one sound eye, but it had been restored by a stroke.

REVIEWS AND NOTICES OF BOOKS

Medical Organisation and Surgical Practice in Air Raids

By PHILIP H. MITCHINER, C.B.E., T.D., M.D., M.S., F.R.C.S., K.H.S., surgeon and lecturer in surgery at St. Thomas's Hospital, London; Colonel, T.A.; D.D.M.S., 1st Anti-Aircraft Corps; and E. M. COWELL, D.S.O., T.D., M.D., F.R.C.S., surgeon to the Croydon General Hospital; Colonel, T.A.; A.D.M.S., 44th H.C. Division T.A. London: J. and A. Churchill. 1939. Pp. 247. 10*s.* 6*d.*

THIS book deals with (1) the medical organisation of air-raid casualties, and (2) their treatment by surgeons, nurses and first-aiders. On the second of these subjects the authors' wide experience of military surgery entitles them to speak with particular authority. Especially valuable are their descriptions of conditions met with in Spain and the procedures adopted there; it would have been interesting, however, to have figures in support of their contention that the "plaster method" of treating wounds results in an increased death-rate from tetanus and gas-gangrene. They rightly condemn the Japanese practice of withholding morphia from casualties, but do not say whether they favour administration of this drug by first-aid workers, as is now permitted to some extent in the Royal Air Force.

In the section on organisation the scheme set out differs in some ways from that described in the official publications. Thus Mitchiner and Cowell describe a unit which they call a dressing-station, and to which they say all casualties should be brought. They say that this unit is the equivalent of the official first-aid post, and they recommend schools as suitable buildings for the purpose. It should, however, be pointed out that the Ministry has given instructions that serious casualties should be taken direct to casualty-receiving hospitals and not to first-aid posts, and that it is now the official policy to place first-aid posts in or near the casualty hospitals. The authors also recommend that casualties should not, save in exceptional circumstances, be detained in the danger area, but should immediately be evacuated to casualty-clearing hospitals, situated (for London) 8–12 miles out. It seems to be the intention of the Ministry, however, to use all the major hospitals as casualty hospitals, irrespective of their position and their structural strength. There are other points of difference; for example, the unit which the authors call a casualty post has not so far been described in the official scheme.

Mitchiner and Cowell's scheme appears in many ways to be an improvement on that officially proposed; but it is open to criticism at certain points. The importance of rapid evacuation out of the danger area is well emphasised, but it is admitted that there will be a certain number of patients who will be unable to stand the journey, or who will require operation of extreme urgency. It is not made clear how such urgent cases are to be selected, for the authors state that sorting of cases is neither possible nor desirable in the danger area. Moreover, while their objections to mobile operating-theatres are obviously sound, it is less easy to agree with their implied condemnation of the mobile unit intended for first-aid and classification work only. Nor does the present state of opinion among architects seem to justify the categorical assertion that "underground bomb-proof buildings are not practicable." The various units of the casualty organisation have an early claim to such full protection as can be made available.

It is hardly likely that any reader will agree about all the subjects treated in a book of this kind; but this does not impair its value. Colonel Mitchiner and Colonel Cowell are to be thanked for producing the first complete and reliable outline of air-raid surgery.

Histological Technique for Intracranial Tumours

By DOROTHY S. RUSSELL, M.D. Lond., member of scientific staff, Medical Research Council, attached to the Bernhard Baron institute of pathology, the London Hospital. London: Humphrey Milford. Oxford University Press. 1939. Pp. 71. 7*s.* 6*d.*

THE staining methods required for an adequate examination of cerebral tumours are so specialised that they are seldom dealt with in ordinary books on histological technique. This admirable account by an expert on neurological oncology of the methods which she uses at the London Hospital fills a real need. The information given is eminently practical;

there are no lists of alternative methods, but detailed descriptions of those stains which have proved reliable in the critical analysis of nervous tumours. Dr. Russell, following in the footsteps of Bailey and Cushing, has shown the importance of accurate histological diagnosis in assessing the prognosis and determining the treatment of these growths. She gives a full account of the rapid method of examining smears from a minute portion of material removed at the time of operation, which is based on Dudgeon's "wet film" technique. By this means she is usually able to indicate to the surgeon in a matter of minutes the nature of any tumour, and the device is proving of increasing value to pathologists who have learned to use it. The book is full of tips on the art of staining, and an agreeable innovation in a technical manual is the inclusion of beautiful photomicrographs showing what may be hoped for if Dr. Russell's instructions are followed. Each histologist has his own favourite methods and if it is not presumptuous to criticise a personal routine which has proved so successful, we suggest that Bouin's fluid might be adopted as a fixative in place of alcohol for the demonstration of glycogen and Apathy's medium instead of glycerin jelly for the mounting of frozen sections.

This manual should be on the staining bench, not the shelves, of every histologist whose work includes the examination of nervous tissues.

A Synopsis of Hygiene

(6th ed.) By Sir WILSON JAMESON, M.D., F.R.C.P., D.P.H., professor of public health in the University of London, dean and director of the public-health department of the London School of Hygiene and Tropical Medicine; and Lieut.-Colonel G. S. PARKINSON, D.S.O., M.R.C.S., L.R.C.P., D.P.H., assistant director of the department. London: J. and A. Churchill. 1939. Pp. 698. 21*s*.

"Gold is refined in the fire" and, at the sixth refining, this work, first published in 1920, reaches a very high quality. It is essentially a book for the public-health worker rather than for the ordinary medical student. Its strength and virtue consists in the fact that it is largely a compilation—though a readable one—from official reports and memoranda. Throughout there are references to original sources easily accessible to those who require further information. In the present edition no fundamental changes of arrangement have been made but the sections dealing with occupation and health, hospitals, maternal welfare and milk have been rewritten and the parts relating to food and drugs and factories have been brought into line with recent legislation. That the information is quite up to date is shown by the inclusion of such legislation as the P.H. (Aircraft) Regulations of 1938 and even the regulations under the Hydrogen Cyanide (Fumigation) Act, 1937, which are still in draft, and of allusions to the sulphonamide derivatives. The section on refuse disposal includes the latest processes such as the Hyganic, Indore and Garchey systems: some reference to the plagues of crickets arising from even well-controlled refuse tips might have been included in this section. We find no mention of ashbins in the index although the ideal receptacle for refuse is described in the text. No explanation appears to be offered of the inclusion of certain sections of public-health law in square brackets. In another edition sections on the more biological aspects of public health—elementary genetics and eugenics, for example—would be welcome. The absence of any reference to air-raid precautions is doubtless due to the impossibility of keeping pace with the changes in procedure: any account of methods current at the time of writing would at the time of reading be like the famous advertisement "That's A.R.P.—that was!"

British Journal of Children's Diseases

IN the January–March issue Mr. Macleod Yearsley, in a paper on the Present Position of Tonsil Operations, deprecates indiscriminate tonsillectomy. He reviews recent literature and observes that tonsils should be removed when they are large, hard, and definitely obstructing the fauces, undoubtedly too septic for other treatment, or accompanied by cervical adenitis. According to Yearsley tonsillectomy is too often done in children and too rarely in adults.—Dr. F. Parkes Weber writes on Transient Pulmonary Infiltration with Blood-Eosinophilia (Löffler's Syndrome), reporting an example of this allergic syndrome in a boy aged 10. The patient seemed well but had long suffered from running eyes and nose, and radiological examination showed an opacity in the lower lobe of the right lung. He had an eosinophilia ranging from 7 to 13 per cent. There was no evidence of intestinal parasites.—Dr. F. R. B. Atkinson contributes a paper on Chloroma in Children, of which he has collected 130 cases (91 in boys, 37 in girls, 2 sex not stated) reported since 1835. The commonest age was between 4 and 5 years; the youngest child was aged 4 months. With the exception of one patient (reported by Washburn), who was still well two years after the use of X rays, no remedy has been found of any avail. The paper contains a table on cytology and a chronological list of the cases, and a full bibliography.—In a paper on Renal Dwarfism Mr. R. M. Bates describes an adult mentally defective dwarf who during life and at necropsy was thought to be an example of renal rickets. Histological examination of one femur showed no rachitic change and the parathyroid glands were normal. The high blood-pressure and retinitis indicated chronic nephritis, but this presumably followed a renal and ureteral dilatation which occurs in the non-hypertensive variety of renal dwarfism. Bates suggests that dwarfism with rickets be called "renal rickets" and dwarfism without rickets be called "renal dwarfism."—The abstracts from current literature are devoted to acute infectious diseases.

Journal of Social Ophthalmology

THIS new journal, which is printed in parallel columns of French and English, is the official organ of the International Association for Prevention of Blindness, and is issued free to members. The second number, dated last November, contains a symposium on myopia, which now ranks with corneal ulcers and accidents as one of the three main causes of blindness. Articles on the preventive measures adopted in various countries are contributed by Mr. Bishop Harman for Great Britain, Prof. Martin Bartels for Germany, Mrs. Hathaway for the United States, Dr. René Odic for France, and Prof. van Duyse for Belgium. These authorities all agree on the value of sight-saving classes and schools, of which the first was instituted by Bishop Harman in London in 1908, and the balance of opinion seems to favour the education of myopes in special classes in ordinary schools rather than in blind schools or special schools. Association with blind children is condemned because of its depressing influence and also because of its cost, which is 13 times that in an ordinary school. The aim of the special class is to train the child so that he can earn his living in spite of his short-sight, and in a full review of the subject Prof. Bartels gives a long list of possible occupations and another of those actually followed by ex-pupils.

THE LANCET

LONDON: SATURDAY, APRIL 1, 1939

JOURNALS OR MICRO-FILMS?

IDEALLY every investigator should be acquainted, at every stage of his work, with all the relevant results obtained by other people. Without such knowledge he may be ill-equipped for his task and may waste time and labour on what has already been done elsewhere. It was to meet this need for current knowledge that the system of publication by papers in periodicals developed, and in the early days of modern science it served its purpose well enough. Now however the system is clearly failing. The number of scientific periodicals is somewhere between 30,000 and 40,000, of which perhaps half are still being issued, and they continue to increase both in number and in size. To make matters worse a very large proportion of the papers they contain—some would say three-quarters—do not really deserve to be published at all; often they have been written only because published work is expected by the authorities who fill appointments and renew grants. Through misdirected zeal, local patriotism, and the tradition of learned societies journals are often kept going long after the need for them has ceased, and unions of overlapping periodicals, of the kind that gave birth to the *British Journal of Ophthalmology* over twenty years ago, are far too few. The general tendency indeed is towards separation rather than amalgamation. But the overgrowth of periodicals is obviously defeating its own ends. A scientific worker, unless he devotes an excessively large proportion of his time to reading, can cover only a small fraction of the papers even on his particular subject, and he is obliged to peruse much that is useless for fear of missing something useful. Moreover, the cost of subscriptions to societies and to journals—of whose contents he probably reads less than a tenth—is a serious drain on his purse and may use up as much as 5–10 per cent. of his salary. If he relies on libraries he may find that the periodicals he requires are wanted by a dozen people at once; furthermore, because of their high cost, many of them never reach any but the largest libraries, and numbers of far-from-insignificant foreign journals never reach this country at all.

To help the individual investigator to find what is worth his reading is the function of the numerous abstract journals now published. But even these are becoming unwieldy. Thus in two of the sciences most closely allied to medicine—biology and chemistry—the abstracts themselves, although so brief as often to be useless, have reached an alarming total bulk. The annual *Biological Abstracts* has now become a volume of nearly 3000 pages, and the indexes, without which it loses much of its value, arrive nearly two years after the text. In this latter respect *Chemical Abstracts* is much better served, but it has attained the appalling mass of three volumes a year, each of about 2000 pages. Not very long ago the Medical Library Association, whose work deserves to be better known on this side of the Atlantic, set up a committee under the chairmanship of Miss ELEANOR FAIR to look into the problem as it affects medicine, and this committee, which reported in 1936, concluded that present methods of publishing abstracts in clinical medicine are neither satisfactory nor comprehensive.[1] Much time and money as well as sincere effort, often representing personal sacrifice on the part of editors and scientists, are producing results that fall far short of goals that might reasonably be attained as regards scope, cost, promptness of issue, and the elimination of duplication. Mrs. CUNNINGHAM[2] is of much the same opinion and makes suggestions for meeting the need, with particular reference to America. It is clear that while some papers are abstracted in several places, others escape all notice.

That the better dissemination of scientific information is becoming urgent is evident from the many references now being made to it. One aspect of the subject was examined by Sir WILLIAM BRAGG in his anniversary address to the Royal Society, which is the theme of a leading article in *Nature*,[3] and a chapter is given to it by Prof. BERNAL[4] in a book we reviewed last week. It is no longer enough, BERNAL says, to publish a record of every new observation; steps must be taken to see that every scientific worker receives just the information required and no more, in just the right form. This will necessitate a limited distribution of detailed accounts for the specialists, a wider distribution of summaries or abstracts, and frequent publication of reports or monographs covering the whole of recent advances in any given field of science. At the back of this system of distribution there must be readily accessible a collection of archives in which reference can be made to work of the past. The problem, as BERNAL sees it, is a purely technical one that ought not to be difficult to solve. The scheme he advocates would make the separate paper, not the periodical, the unit for publication. Each paper would be submitted to a central editorial board for its specialty, and if accepted would be reproduced on a standard cinema film. As many positives of this would be produced as were needed for distribution to interested specialists and to libraries, and the original master copy of the film would be stored so that copies could afterwards be run off on demand. This would obviate the present wasteful system of reprints, in which the cost is borne by the author and the reprints are often unobtainable by those who need them most. The methods of microphotography in use for these purposes have lately been described by

1. Fair, E., *Bull. med. Libr. Ass.* 1936, **25**, 33.
2. Cunningham, E. R., *Ibid.*, 1938, **26**, 211.
3. *Nature, Lond.* March 11, 1939, p. 391.
4. Bernal, J. D., The Social Function of Science. London, 1939, p. 292.

RANEY,[5] PAGE and SAYCE,[6] and BRADFORD,[7] and preliminary arrangements are in hand in this country for making micro-film records at a cost of ½d. per quarto or perhaps less.[8] The scheme outlined by BERNAL would be run in conjunction with a system of abstracts, which, he suggests, would be on cards to be sent to libraries and institutions, and appropriate selections would be sent to research workers who asked for them. Reports, monographs, and original scientific works of larger compass than individual papers would be published as at present but under a more unified editorship. The only kind of periodical that would remain after these reforms would be that which publishes, in the form of notes, the latest scientific news and reflects "the relation of science to wider social problems."

Arrangements such as those proposed by Prof. BERNAL would have many advantages, though, as he recognises, precautions would have to be taken against certain abuses. Vested interests would be opposed to it, but these he does not regard as serious, for very few scientific periodicals are commercially profitable. We fear however that he minimises the inertia and conservatism of human nature. Thus the need for some kind of projector or reading apparatus will militate against the extensive use of microphotographic films; and how are we to cater for those who like to read in the train, at meal-times or even in bed? If libraries ever come to consist mainly of films stored away in boxes, gone will be the pleasures and educational benefits of "browsing." It seems more probable that in this new revolution a small beginning will be made by wider application of the method already used by Science Service, Washington,[9] which leaves the present system of periodical publication untouched but employs microphotographs for longer papers that cannot readily be accepted by editors. A short abstract only is published in the journal and any interested person can purchase a film of the full paper from Science Service at a cost of about 1 cent. per page. This scheme of "auxiliary publication," recently discussed again by SEIDELL,[10] ensures that papers are perpetually "in print," but no extensive, space-consuming stocks need be stored. All that is needed is the original document itself and the micro-film negative.

DIPHTHERIA

THE immediate use of antitoxin remains as imperative as ever for every patient suffering from, or even strongly suspected of, diphtheria. But since 1927 there have been increases in the fatality-rate—recorded at first particularly from Germany—which could not be put down entirely, or even largely, to delay in diagnosis or to inadequate serum treatment.

5. Raney, M. L., Microphotography for Libraries. Chicago, Amer. Library Ass., 1936 and 1937.
6. Page, B. S., and Sayce, L. A., *Libr. Ass. Rec.* 1938, **40**, 16.
7. Bradford, S. C., *Nature, Lond.* March 11, 1939, p. 393.
8. Information may be obtained from the hon. secretary, Research Coördination Committee, 35, Gordon Square, London, W.C.1.
9. Davis, W., *Science*, 1936, **83**, 402.
10. Seidell, A., *Ibid*, March 10, 1939, p. 219.

In 1931 ANDERSON, HAPPOLD, MCLEOD and THOMSON[1] of Leeds described three distinct types of *Corynebacterium diphtheriæ*, which they named gravis, mitis and intermedius from the relative severity of the clinical pictures produced. In its main features this discovery has withstood criticism and has profoundly modified our views not only on the efficiency of treatment, but also on the diagnosis and pathology of diphtheria. The current number of the *Journal of Pathology and Bacteriology* contains five papers which deal with some of the more important questions raised by this new work. In the first place, are the differences described by the Leeds workers definite and constant enough to justify the subdivision into three distinct types, and if so are the names proposed justified on clinical grounds? K. and I. ZINNEMANN,[2] like many others, are in entire agreement with the original findings and they also agree that the different types are remarkably stable through many subcultures in the laboratory. SHONE, TUCKER, GLASS and WRIGHT[3] confirm the important observation made by other workers that the differences between the three types of infection do not depend merely on differences in the time of admission to hospital or of beginning serum treatment. They record however that in Liverpool it was the intermedius and not the gravis type which caused the greatest number of severe cases and deaths. There is already abundant evidence that the relative severity of gravis and intermedius infections varies from district to district, and this discrepancy may be partly due to variations in methods of typing or of assessing clinical incidence. For example, WILSON and GOLDSWORTHY[4] find that type-differentiation is most definite when rabbit or guineapig blood is used in the culture medium. Factors of this kind are obviously important, and it is certainly desirable that standard media should be used in comparing type-incidence in different districts. SHONE and his colleagues[5] point out that if notifications are used as a basis for the calculation of incidence wholly unreliable conclusions may be reached, for of 2960 cases notified as diphtheria they found by bacteriological methods that more than a third were falsely diagnosed. It is not suggested that treatment should be delayed until the clinical diagnosis has been confirmed bacteriologically, but from the administrative and epidemiological standpoint the accuracy of bacteriological diagnosis must be very high if the total or the type-incidence is to be properly assessed. Such considerations, however, do not seriously affect the main conclusion to which the bulk of recent work leads—namely, that despite variations in severity of gravis and intermedius infections the claims of the Leeds workers are justified, and that there is a definite relation between bacteriological type and clinical

1. Anderson, J. S., Happold, F. C., McLeod, J. W., and Thomson, J. G., *J. Path. Bact.* 1931, **34**, 667.
2. Zinnemann, K., and Zinnemann, I., *Ibid*, 1939, **48**, 155.
3. Shone, H. R., Tucker, J. R., Glass, V., and Wright, H. D., *Ibid*, p. 139.
4. Wilson, H., and Goldsworthy, N. E., *Ibid*, p. 125.
5. Shone, H. R., Tucker, J. R., Glass, V., and Wright, H. D., *Ibid*, p. 129.

severity. McLEOD, ORR and WOODCOCK [6] rightly argue that post-mortem demonstration of the lesions produced by the different types is the most convincing of all answers to criticism directed against the validity of type-differentiation. In an analysis of 51 post-mortem examinations on patients who died of diphtheria they found that gravis infections produce a severe and generalised toxic effect on the viscera, associated with hæmorrhagic necrosis of the tonsils penetrating to the deeper tissues and involving the cervical lymph-nodes, whereas in mitis cases respiratory obstruction from the formation of a tough membrane extending down the air-passages is the usual cause of death. Intermedius infections give a picture nearer to gravis than to mitis.

The further question why the gravis and intermedius types produce this picture of greater severity both in life and after death remains unanswered. The possible explanations seem to be (1) that the gravis type produces a different kind of toxin from the mitis; (2) that it produces the same toxin in greater amount; and (3) that it produces some additional effect which cannot be attributed solely to toxic action. The first explanation is perhaps the least likely, despite the relative resistance of gravis infections to antitoxin. This resistance in itself does not necessarily point to a new kind of toxin, and there is a good deal of other evidence which suggests that all types produce the same toxin. McLEOD, ORR and WOODCOCK find that although post-mortem evidence shows that toxic effects are in general more severe in gravis than in mitis infections, the histological differences are quantitative rather than qualitative. On the experimental side ZINNEMANN and ZINNEMANN agree with other workers that in guineapigs ordinary active and passive immunisation are as effective against gravis as against mitis toxin, and that serum prepared against gravis toxin is no better than ordinary commercial antitoxin in protecting against gravis infection. These two lines of evidence, the one histological, the other experimental, suggest that the second explanation may be the right one—namely, that the gravis and mitis toxins differ not in kind but only in degree, and that gravis infections are more severe than mitis because they give rise to greater amounts of an identical toxin. The fact that gravis strains have been found by several workers to be relatively poor producers of toxin in vitro does not necessarily discount this view, since the conditions in vivo are unlikely to be the same as in the laboratory. But this may not be the whole story. There have been many isolated reports that gravis strains have a greater power of invasion than mitis, and ZINNEMANN and ZINNEMANN found that invasion of internal organs took place in 40 per cent. of guineapigs inoculated with gravis organisms and only in 12·5 per cent. of those inoculated with mitis organisms. How important this greater invasiveness may be it is too early to say, but McLEOD, ORR and WOODCOCK are possibly quite right in suggesting that gravis types give rise to a more severe disease because owing to their greater penetrative power toxin is more rapidly absorbed by the host.

These papers make it clear that the conception of diphtheria as a pure intoxication may have to be profoundly modified. There is no doubt that antitoxin saves many lives that could be saved by no other method of treatment, but many severe cases still fail to respond to large doses of antitoxin. In this country there is still a case-mortality in the neighbourhood of 5 per cent., and this is liable to rise to 10 per cent. or even more in epidemics especially due to gravis or intermedius types. It is to be hoped that the recent work on the different bacterial types, while it may cause an adjustment of our views on the consistent value of treatment in the established disease, may for that very reason stimulate the more intensive use of active immunisation which can effectively prevent it.

[6]. McLeod, J. W., Orr, J. W., and Woodcock, H. E. de C., *Ibid*, p. 99.

MEDICAL ASPECTS OF AVIATION

As we have already announced, the Secretary of State for Air has appointed a standing committee to advise him on the medical aspects of safety and efficiency in flying, and to study the best means of selecting flying personnel and maintaining their physiological efficiency. This action shows realisation of the fact that in the advancement of aviation the man is as important as his machine—a fact liable to be forgotten in this mechanical age. The committee, over which Sir Edward Mellanby, F.R.S., presides, represents all branches of medicine interested in aviation. Psychology, which plays an important part in an airman's make-up, is represented by Prof. F. C. Bartlett, F.R.S., of Cambridge University; neurology by Dr. E. A. Carmichael of the National Hospital, Queen Square; otology, which includes methods of reducing aircraft noise and vibration and the improvement of aerial telephony, by Mr. C. S. Hallpike of the Ferens institute of otology at the Middlesex Hospital; and physiology as applied to aviation, especially in relation to altitude flying and blacking-out, by Mr. B. H. C. Matthews, Sc.D., of Cambridge. Sir John Parsons, F.R.S., is concerned with vision and Prof. L. J. Witts of Oxford with aviation medicine, especially its application to the selection of candidates for flying. On many questions these specialties will overlap, so that a close liaison will be necessary. Air Vice-Marshal A. V. J. Richardson, director of medical services of the Royal Air Force, who formulated the plan for the research committee, is an ex-officio member, while Air-Commodore H. E. Whittingham is the chief executive officer.

Medical research in aviation has hitherto been carried out mainly by the various R.A.F. consultants. The late Group-Captain Martin Flack was, until his death in 1931, the British authority on aviation medicine, and it was chiefly through his researches and teaching that the present-day standards of physiological efficiency were adopted for the selection of flying personnel. With Dreyer, Corbett and Bazett he had done much during the

late war to establish the technique of oxygen administration for flying at high altitudes, and he also showed the value of oxygen for long flights at lower heights (10,000–12,000 ft.) as a means of lessening fatigue. Group-Captain G. S. Marshall, who succeeded Flack as physiologist, working with the Air Ministry's scientific research staff at Farnborough, has developed the present method of supplying oxygen at high altitudes, using pressure suits at heights above 35,000 ft.; it was in one of these suits that the late Flight-Lieutenant M. J. Adams attained a height of 54,000 ft.—a record only recently broken by the Italian, Colonel Pezzi, when he reached 56,000 ft. last October. Nervous factors concerned with flying and the mental attitude for aviation were studied from 1917 to 1920 by Henry Head, W. H. R. Rivers and Squadron-Leader P. S. Rippon, and as a result certain tests for nervous stability and additional questions of family and personal history have been incorporated in the medical examination of candidates for flying. Group-Captain H. L. Burton, the consultant in neurology, has continued this work, especially in connexion with prognosis where there are significant temperamental defects and excellencies, and Squadron-Leader G. O. Williams, working with Prof. Bartlett, has apparently succeeded in foretelling the flying aptitude of candidates by means of sensorimotor coördinating machines and a form-relation test, which may revolutionise medical examinations.

The medical entrance examination for the R.A.F. has been continually under review, and certain modifications have been made from time to time. Group-Captain H. A. Treadgold, when consultant in medicine, introduced the orthodiagram and electrocardiogram into the examination; he also established a relationship between body-build and functional efficiency and studied the significance of blood-pressure. This work has been pursued by his successor, Group-Captain A. F. Rook, who, in conjunction with Flight-Lieutenant Dawson, published an article on hypotension and flying in this journal last December. Wing-Commander E. D. D. Dickson, consultant in otolaryngology, has demonstrated the loss of auditory acuity resulting from continued exposure to present-day aeroplane noise, and with Mr. A. W. G. Ewing, Ph.D., and Mr. T. S. Littler, Ph.D., of Manchester, has been investigating ways of protecting the ears of aircraft crews against excessive stimulation. In ophthalmology, too, considerable progress has been made—first, by Group-Captain E. C. Clements, who instituted a training for heterophoria, to help prevent bad landings due to this condition, and who coöperated with the Air Ministry scientific staff in improving bomb-sight and cockpit lighting; and since 1934 by Wing-Commander P. C. Livingston, the present consultant in ophthalmology, who has perfected the heterophoria training and has been mainly responsible for the development of new flying goggles and spectacles which counteract the effects of glare from the sun and from night-landing flares.

ANNOTATIONS

STORED BLOOD

EXPERIENCE of stored blood for transfusion has been limited in this country to small groups of patients. In our present issue Dr. F. Duran Jorda, who was head of the blood-transfusion service of the Spanish republican army, describes his conclusions drawn from experience with 9000 litres of blood obtained from 20,000 withdrawals and the classification of 28,900 donors. His methods of withdrawal and storage appear complicated on paper, but medical visitors to his institute in Barcelona and those who have had the privilege of talking to him in London are impressed by the simplicity of the method in action. It is clearly a great advance on any system that has been advocated in this country. The great advantage, especially in time of war, is that large quantities of blood (25–30 litres per hour) can be withdrawn and prepared for use in a short time under sterile conditions. The apparatus is so devised that administration of the blood is very simple and can be carried out single-handed by anyone capable of doing a venepuncture. The greatest danger with stored blood is hæmolysis, which lessens the therapeutic value of the blood and favours reactions after transfusion. The commonest cause of hæmolysis is shaking the blood in transit. Duran Jorda has reduced movement of the blood to a minimum by his special ampoule. This fact alone should attract close attention to his technique. In time of war blood may have to be transported for long distances, and any system that prevents it from being shaken is clearly important. The blood is stored under two atmospheres' pressure of air; this facilitates administration and, Duran Jorda believes, establishes an automatic bacteriological control. The oxygen present prevents the growth of anaerobes, while if aerobes are present they grow at the expense of the oxygen, thus converting the bright red oxyhæmoglobin into dark red reduced hæmoglobin. A glance at the flask, he claims, is sufficient to show whether the blood is sterile. He advocates the use only of group IV–O blood for emergency purposes, for it is impossible to obtain accurate grouping under war-time conditions. He mixes the blood from different donors, because in this way the agglutinin titre is reduced and a more homogeneous blood obtained. Some patients received transfusions from as many as 96 donors without ill effects. The work he describes is of biological interest as well as of practical importance in both peace and war.

PSYCHIATRIC ASPECTS OF CRIME

THE official inquiry by Norwood East and Hubert[1] into the treatment of crime produced much that is of technical interest to psychiatrists in addition to the administrative proposals which are its chief practical outcome and which were commented on in our issue of March 11 (p. 583). During the last four years Dr. Hubert has investigated more than 400 selected offenders and his conclusions as to the form, psychopathology, and therapeutic possibilities of their disorders are a valuable contribution to forensic psychiatry. A preliminary objection likely to be made is that his material might have been unduly

1. The Psychological Treatment of Crime. By W. Norwood East and W. H. de B. Hubert. 1939. H.M. Stationery Office.

—that is, unrepresentatively—refractory or responsive, depending on the accuracy of the initial estimate of suitability; since, however, the cases were selected by Dr. Norwood East, whose experience is unrivalled in this country, and by Dr. H. T. P. Young, the medical officer at Wormwood Scrubs, this objection cannot be regarded as valid. Hubert's methods have obviously not been limited to those of one "school": general psychiatric principles have bulked larger than any routine procedure. It is not only the comparatively small group likely to respond to specialised psychotherapy that has been found accessible to psychiatric treatment. And, as the report points out, the practice of psychotherapy as a specialty divorced from general psychiatry is apt to lead to lessened efficiency and to unwieldy development of the therapeutic method itself. In the description of the treatment employed, there are some significant obiter dicta. Thus it is said that in the "complex method" the patient gains experience and a new pattern of behaviour in spite of the fact that this new understanding is not plainly expressed in words or its nature even completely grasped by him. Moreover, the challenging statement is made that the analytical therapeutic method is "primarily dependent upon an analysis of the form of abnormal function, and the content of the latter, in which there will be much individual variation, is only of secondary importance." These views are elaborated in relation to the individual conditions and their actual treatment, and are supported by detailed case-histories. The cases were mainly men belonging to the recidivist class or guilty of sexual crimes. In both groups a distinction is drawn between those mentally normal and abnormal in the ordinary psychiatric sense. In selecting suitable subjects for psychotherapy from the normal group it was found that the time and mode of onset of the criminal conduct were important, as were the offender's reaction to its consequences and the history of his emotional development. Contra-indications were the lack of any wish to change, a set personality, strong environmental influences tending to cause or perpetuate criminal conduct, an attitude of acceptance, resentment or resignation, or an inclination to use psychotherapy for ulterior purposes.

In the section dealing with sexual offences the important observation is made that pure perversion is rare: besides the main abnormality—e.g., masochism or homosexuality—there is almost always a conspicuous interest in other perversions, often carried to the length of actual performance. In short, there is in these people a tendency towards general sexual perversion, which takes one or other form according to the environmental factors. From this follow some important practical consequences. It is usually assumed that homosexuality is not related to other forms of sexual perversion, and that it is due to environmental influences combined with a hypothetical constitutional factor, possibly endocrine. In accordance with this view the psychotherapist has in the past preferred cases with the fewest "feminine" characteristics, especially on the physical side, and has regarded strong heterosexual interest also as a favourable point. This is not borne out by Hubert's experience. The feminine characteristics may indicate only that environmental factors were readily called into play owing to the patient's seductive appearance, and such cases may respond well to treatment. The absence of overt heterosexual experience is of advantage inasmuch as treatment can then be directed towards developing an unknown potentiality, rather than a quality which has already been fully explored by the patient and rejected as his main mode of sexual activity. Incidentally Hubert and East state that the popular psychological assumption of an intimate relationship between paranoid states and homosexuality is probably a misconception. No English work has hitherto dealt as fully as this report with sexual perversion and adolescent crime from the psychiatric angle.

SCHOOL MEALS AND MILK

On Monday last the President of the Board of Education received a deputation from the Children's Minimum Council who submitted a statement on school meals and milk. The supply of these extras, said the deputation, does not go far enough, and the need for more generous provision will increase with the compulsory raising of the school-leaving age without maintenance grants. The deputation proposed that (1) a daily ration of milk should be provided free to all children at elementary and state-aided secondary schools; (2) local authorities should be required to make provision for a midday meal at all their schools; (3) meals should be provided free for children coming from families in which the money available for food falls below a scale laid down by the board in accordance with modern scientific requirements; and (4) the board should enforce proper standards of accommodation, service, and dietary. Lord De La Warr, in reply, said that pressure is being brought to bear on backward authorities, but financial reasons (apart from any others) make the council's proposals unrealisable at the present time.

SURGICAL RELIEF IN OXYCEPHALY

Most patients suffering from oxycephaly sooner or later complain of severe headache due to a raised intracranial pressure, and develop bilateral exophthalmos and papilloedema which finally results in optic atrophy and blindness. A number of operative procedures have been devised to save the patient's sight, including unilateral and bilateral subtemporal decompression, linear craniectomy, circular resection of the skull, and even resection of the optic canal, but none of these have proved successful. King[1] has now described an ingenious operation, the purpose of which is to allow a uniform expansion of the brain in all directions and at the same time to relieve the raised intracranial tension permanently. A large horse-shoe flap consisting of the scalp, galea aponeurotica, temporal fascia, temporal muscle and pericranium is turned down on one side of the cranium, hæmostasis being secured by a pedicle clamp and skin-clips. A series of burr-holes 2 in. apart are then made in the exposed skull, and the holes are joined by cutting the intervening bone. The dura is never opened. The effect of this procedure is to convert a large area of the skull into a crazy pavement of triangular and quadrangular bone fragments, and separation of the interstices allows the subjacent brain full expansion. King performed this operation on a boy of eight years whose vision was rapidly deteriorating and whose cerebrospinal-fluid pressure was 400 mm. of water. The skull showed the typical "beaten silver" appearance of oxycephaly and there was marked bilateral exophthalmos and squint. At the end of the operation the exophthalmos had quite gone on the side of the operation and had improved on the other side. The skull completely healed in five weeks and a radiogram taken two and a half months after the operation showed a great change in the size, shape, and contour of the skull;

1. King, J. E. J., *Arch. Neurol. Psychiat., Chicago*, 1938, **40**, 1205.

moreover, digital impressions had nearly all disappeared. Vision, which before the operation had been limited to a few feet, improved so that the patient could see the same objects at a hundred feet, and the mental condition also improved considerably.

TYPHOID ANTIGENS

THE extensive studies that have been made on the O and Vi antigens of the typhoid bacillus since these two components, and the corresponding antibodies, were first differentiated by Felix and his colleagues, have raised new questions at least as fast as they have answered old ones. One major discrepancy in behaviour became obvious at a very early stage. A heat-killed O + Vi strain was found to be incapable of stimulating the production of Vi antibody in the rabbit or the horse; but a heat-killed vaccine from any mouse-virulent (O + Vi) strain was, as Perry and Findlay had shown, capable of inducing an effective active immunity in mice. When passive-protection tests were used in place of active immunisation the results were different. Felix and his colleagues showed that an antiserum prepared by immunising rabbits with living O + Vi bacilli, which contains both O and Vi antibodies, is far more effective in protecting mice against virulent O + Vi bacilli than a serum containing the O antibody alone. In these tests, and in those of other workers who recorded analogous results, the living bacilli used for infection were suspended in broth or saline. Soon the discrepancies multiplied. It was found that the injection into rabbits of O + Vi bacilli killed with formalin, or of extracts prepared from O + Vi bacilli in various ways, would induce the formation of Vi antibody which agglutinated Vi, or O + Vi, bacilli to high titre. These antibodies, however, had little protective effect against O + Vi bacilli. Although they contained a determinant grouping corresponding to the specific grouping of the Vi antigen they were in some way functionally deficient.

Two recent papers by Henderson[1] of the Lister Institute add significantly to our knowledge, and to our problems. The first deals with differences observed when the living typhoid bacilli are suspended in a solution of mucin instead of in broth. The effect of this procedure, as earlier workers have shown, is greatly to decrease the average lethal dose of such O + Vi strains as Ty_2, from approximately 7,500,000 to approximately 500 bacilli. A pure Vi antiserum was prepared by immunising rabbits with a rough Vi variant, and a pure O antiserum by immunisation with an O strain. When these antisera were tested, in falling amounts, against living O + Vi bacilli suspended in mucin, it was found that their protective effect was substantially equal, the Vi antiserum giving slightly, but insignificantly, better results. When similar tests were made with O + Vi bacilli suspended in broth the results were very different. Both antisera were much less effective, as judged by the ability of a given amount of serum to protect against a given multiple of the average lethal dose; but the potency of the O antiserum under these conditions was much lower than that of the Vi antiserum. This observation establishes the important point that the protective power of an antibacterial serum is determined by the total number of bacteria against which it has to act rather than, or in addition to, the number of average lethal doses contained in the test inoculum. The O strain of *Bact. typhosum* against which the O antiserum was prepared, and the rough Vi variant, were both lethal for mice in adequate dosage. Tested against these strains instead of against the O + Vi strain Ty_2, the protective effects of the O and Vi antisera were sharply specific.

In his second paper Henderson records further observations on the functional deficiencies of the Vi antibody produced by immunising rabbits with a Vi antigen prepared by extracting the bacilli with diethylene glycol. Although this antibody agglutinated Vi bacilli to approximately the same titre as an antibody produced against the living rough Vi variant, its protective power was about 25 times less. The antiserum prepared against the living bacilli gave complement fixation to high titre in the presence of either the whole bacterial cells or the diethylene-glycol fraction. The antiserum prepared against the diethylene-glycol fraction gave good complement fixation with the fraction itself, but only a trace of fixation with the intact bacterial cells.

1. Henderson, D. W., *Brit. J. exp. Path.* February, 1939, pp. 1 and 11.

INTRAVENOUS INJECTION OF ASCITIC FLUID

SINCE the reduction of the blood volume which takes place in shock is accompanied by concentration of the red cells, the ideal fluid for restoring the blood to its original volume must be plasma. Unfortunately this is difficult to obtain in sufficient quantity for the purpose, and various substitutes have been tried and rejected. Non-colloid salines are only of temporary value, and the results with foreign colloids, such as the gum solutions, have been variable. Animal experiments with ascitic fluid have been more hopeful, and Davis and Blalock[1] now publish a report on its use in the human subject. They found that the protein content of ascitic fluid varied between 28 and 45 per cent. of that of blood plasma. Intravenous injection of filtered ascitic fluid caused few reactions, but precautions had to be taken to give the correct group only. The largest quantity given was 2500 c.cm., and there were no ill effects from this. In a case of severe shock consequent on a gunshot wound of the abdomen ascitic fluid injected intravenously raised the blood-pressure, but this effect was temporary. It is suggested that concentration of the fluid may make it a more effective agent against shock.

PREMATURE SEPARATION OF THE PLACENTA

IN 407 cases of premature separation of the normally implanted placenta, among 36,465 deliveries at the Boston Lying-In Hospital during the last twenty-two years, Sheldon[2] found that the incidence of accidental hæmorrhage was 1 in 90. He recognises two distinct groups of ætiological factors: predisposing factors, of which toxæmia heads the list by its presence in 176 cases (43 per cent.), and precipitating factors, of which he considers labour by far the most important, 67 per cent. of his patients being in labour when admitted because of the hæmorrhage. (Genuine trauma, such as a fall or a blow, accounts for little more than 1 per cent. of the whole series.) The true relation between accidental hæmorrhage and the various toxæmias of pregnancy is thus raised again. Prof. F. J. Browne,[3] of University College Hospital, has convincingly demonstrated the importance of toxæmia and reported it in 19 of his 23 cases (83 per cent.); but his series was a very small one compared with Sheldon's, and the 43 per cent. given by the latter is presumably nearer the truth.

In the treatment of these cases Sheldon very

1. Davis, H. A., and Blalock, J. F., *J. clin. Invest.* March, 1939, p. 219.
2. Sheldon, C. P., *New Engl. J. Med.* Dec. 8, 1938, p. 913.
3. Browne, F. J., Antenatal and Postnatal Care, London, 1937.

wisely insists that delivery should be effected by whatever method produces least shock in the circumstances. He emphasises a rule that all obstetricians recognise in theory but sometimes disobey in practice—namely, that the lost body fluids must be restored, and shock combated, before attempting to deliver the patient. He unreservedly condemns cæsarean section, except when it is indicated by some obstetric complication, such as cephalopelvic disproportion or previous cæsarean section. Hysterectomy was performed only 3 times in 107 cæsarean sections; he estimates the mortality from this operation to be 30 per cent. For the most part, his patients had a normal delivery. The result of this conservatism was that the gross maternal mortality was only 4·4 per cent., with a fœtal mortality of 54·3 per cent. These figures make a convincing plea for the wider use of conservative treatment of these cases and demonstrate once again the limitations of cæsarean section.

IRRADIATION OF ZOSTER

Lomholt of Copenhagen has repeatedly drawn attention to the fact that local inflammatory processes involving cutaneous nerve-endings can often be benefited by ultraviolet irradiation, and there have been many reports, both in this country and on the Continent, of the regression of lesions and relief of pain in zoster after irradiation. These reports are confirmed by an analysis made by Devois and Proux [1] of 100 successive cases of zoster treated with erythema-producing doses of ultraviolet light applied to the cutaneous lesions. They divide their cases into early (seen before the fifth day of the eruption), intermediate (up to three weeks) and late. In early cases, of which there were about 30, the results were uniformly good; the attack was aborted, early regression took place, and there were no painful sequelæ. In intermediate cases the remaining vesicles and crusts cleared up but pain referred to the area of eruption often persisted for weeks or months. Few of the cases with painful sequelæ were benefited, and incidentally these were not always relieved by X-ray irradiation of the appropriate spinal region. In early ophthalmic herpes the results were not so brilliant, possibly because irradiation had to be given more cautiously. The success of this treatment seems to depend first on giving a dose sufficient to produce erythema and secondly on giving it early.

HORSE-SERUM NEURITIS

RECORDING five cases of horse-serum neuritis in males aged from 16 to 29, all following injection of tetanus antitoxin, Bennett [2] says that in a small minority of cases neurological complications occur at the onset or height of serum disease. While cerebral, meningeal and spinal lesions may be found, the commonest localisation is in the peripheral nerves. Mostly the nerves from the cephalic part of the brachial plexus (fifth and sixth cervical roots) are affected. Severe neuritic pains are felt in the neck, shoulders, arms and legs; flaccid paralysis is observed usually within 48 hours and is followed by a gradual atrophy of the muscles. Muscle tenderness, hyperæsthesia and dull pains persist for several weeks. The exact cause of the condition is not known, but the most plausible theory is that of a perineural urticaria and œdema, which produces a compressive or ischæmic paralysis of the nerve trunks or peripheral nerves. Almost all the reported cases have been in adults, the average age being 26, and men are more frequently affected than women. In more than half the cases the complication has followed the prophylactic use of tetanus antitoxin, but nearly all types of horse serum have produced it. The prognosis is good, recovery taking place within six months, but about 20 per cent. of the patients are left with residual weakness and atrophy. In Bennett's series three recovered completely and two incompletely. Treatment is mainly symptomatic.

1. Devois, A., and Proux, C., *J. Méd. Paris*, Jan. 26, 1939, p. 70.
2. Bennett, A. E., *J. Amer. med. Ass.* Feb. 18, 1939, p. 590.

POLYCYTHÆMIA

THE florid polycythæmic patient who complains of such symptoms as headache, breathlessness or paræsthesiæ is easy to recognise, and a blood-examination usually makes the diagnosis obvious. But the disease is a chronic one and during its course assumes various forms which may pass unrecognised by one familiar only with the classical picture. Rosenthal and Bassen [1] have followed 75 cases over a number of years in hospital or private practice, and point out that although most patients complain of the more direct effects of the increased number of red cells there are others who have no symptoms at all, and others again in whom vascular disease—gangrene of the digits, Raynaud's disease, cerebral, hepatic, or portal thrombosis—is the outstanding feature. They found that the red-cell count and hæmoglobin are typically high in the earlier stages, but may be normal later, or the hæmoglobin may fall while the red-cell count remains high. Later still there may be a rise in leucocytes or blood-platelets, and such cases may show a widespread tendency to thrombosis without the blood-count being typical of polycythæmia. In the terminal stages the disease may present itself as a leukæmia, a thrombocythæmia, an obscure anæmia, or various combinations of these. Since almost all of Rosenthal and Bassen's patients were treated with phenylhydrazine or X rays, it is difficult to say what effect treatment had on the course of the disease. The increase in red cells in the so-called polycythæmia vera may yet be proved to be compensating for some condition causing a diminished supply of oxygen to the tissues, in which case its reduction might be theoretically inadvisable. A study of untreated cases is needed to answer the question whether it is wise to give such potent remedies as are now customary to patients with an unexplained rise in hæmoglobin and red cells.

A SURGEON'S AUTOBIOGRAPHY

AN autobiography of Anton von Eiselsberg [2] gives a happy and detailed account of a great career in surgery which seems to have been achieved without stress or difficulty. The author had the good fortune to be a pupil and assistant of the great Billroth, and in 1901, having already occupied university chairs in Holland and Germany, he succeeded his master as professor of surgery in Vienna, in which post he remained for thirty years. Eiselsberg passes over his association with Billroth rather rapidly, and the greater part of the book is concerned with journeys abroad, where he was always received with enthusiasm. Since the narrative is meant chiefly for the general reader it contains but little clinical material, but the story is told of an operation on the King of Greece (for empyema) at a critical stage of the world war, when the Allies and the Central Powers were competing for his favour. There

1. Rosenthal, N. R., and Bassen, F. A., *Arch. intern. Med.* 1938, **62**, 903.
2. Lebensweg eines Chirurgen. By Anton Freiherr von Eiselsberg. Vienna: Tyrolia-Verlag. 1938. Pp. 566. R.M.10.

is also an interesting account of a death from air embolism during an operation for a tumour of the spinal cord. Under normal circumstances the admission of a small quantity of air into a systemic vein is well tolerated, but in this patient the foramen ovale had remained patent and the air was able to reach the left ventricle and the coronary vessels. The book concludes with a series of short papers on various surgical problems. One of them, on the value of animal experiment in surgery, notes that Billroth's first gastrectomy for carcinoma was preceded by a series of canine operations and that his total extirpation of the larynx for carcinoma was only done after experiments had demonstrated the practicability of the procedure.

THE FUTURE OF THE VOLUNTARY HOSPITALS

THE position of the voluntary hospitals is just now exercising the mind of everyone concerned with their work, and committees and conferences, official and unofficial, are considering their future. At the annual general meeting of the Manchester Northern Hospital, which each year has a deficit of between £4000 and £5000, Prof. J. S. B. Stopford, F.R.S., vice-chancellor of the University of Manchester, pointed out that the steady increase of costs is due largely to the advance of knowledge, and is therefore unavoidable. He summarised the three main proposals made to put the hospitals on a sounder financial footing: the first is a regional grouping of hospitals with pooling of their resources; the second is that voluntary hospitals should be subsidised by the state either directly or through the local authority; and the third is an extension of the contributory schemes. The argument in favour of regional grouping is that not all voluntary hospitals are in debt and if their total income was collected and reallocated they would be more or less solvent; but it is doubtful whether in these circumstances the income would not greatly diminish, since local patriotism and pride in a particular institution contribute largely to its support. The second solution, a state subsidy, was recently suggested by the Interdepartmental Committee on Nursing Services as a way of meeting the large additional expenditure that will be involved in improving the conditions under which nurses are employed, but hitherto there has been reluctance to accept grants that carry some measure of control, since the voluntary hospitals regard independence as an essential factor of their service to the community. There are signs that they are beginning to realise that a subsidy under defined conditions will not necessarily destroy this independence; and indeed some of them are seeking such help. In the House of Lords last week (see p. 785) the delay by a Scottish local authority in responding to an invitation for such coöperation was deplored, and nowadays payment to voluntary hospitals for accommodation placed at the disposal of such authorities is being made. As we mentioned last week the Prince of Wales's Hospital, Plymouth, has appealed successfully to the city council for financial support, and it has recently expressed surprise and regret at the refusal of the Devon county council to give help such as is given by the Cornwall county council. As for the third solution, Prof. Stopford believes that an extension of contributory schemes offers a chance of some relief in the immediate future; but ultimately, in his view, the best plan may be to finance medical work, including hospitals, by a state health tax graded like income-tax, according to capacity to pay. He realises that such a scheme would imply the institution of a national medical service but holds that the dangers of such a service could be avoided and that the advantages of the voluntary hospital system could be retained.

PROSTATIC RESECTION IN ELDERLY PATIENTS

CERTAIN important points in the treatment of prostatic obstruction in elderly men by resection are summarised by Dr. A. H. Gundersen.[1] After pointing out what has at last been generally recognised—namely, that success in perurethral surgery varies directly with the operator's experience—he emphasises the fact that the perurethral approach is ideal for elderly and debilitated patients, but that, to be successful, the resection must be carried out rapidly and with the minimum of hæmorrhage. Availing himself of Flocks's and Alcock's researches on the blood-supply of the hypertrophied prostate, he starts with two deep cuts at the five and seven o'clock positions. These bring him into contact with the large arteries to the subvesical and middle lobes of the hypertrophied gland, and hæmostasis is secured by immediate coagulation. The remaining intravesical projections, with the exception of the anterior lobe, then become relatively avascular. The only other situation at which extensive bleeding is likely to take place is at the apex of the prostate near the verumontanum, and this region is left untouched until towards the end of the operation. Adequate removal of all obstructing tissue is essential to success, especially in a debilitated patient with poor bladder musculature. In Gundersen's opinion, a second resection is often poorly tolerated, and if it has to be done it should always be postponed until the patient is afebrile and definitely on the mend. In deciding whether sufficient tissue has been removed a telescope with a retrograde view is a great advantage. It must never be forgotten that an enlargement of the anterior lobe is sometimes the cause of obstruction. When, during efforts to make lateral excavations of the lateral lobes, the prostatic capsule has been exposed, there may be troublesome bleeding from the venous plexus. To control this type of hæmorrhage, some form of hæmostatic bag will be necessary. Another feature of Dr. Gundersen's treatment is the use of 40 grains of sulphanilamide daily, with sodium bicarbonate, to reduce sepsis. This drug has also proved of value late in convalescence in clearing up infection after sloughing has come to an end.

Dr. GERHARD WAGNER, the medical leader of the Third Reich, has died in Munich at the age of 50. He was one of the founders of the National Socialist Aerztebund in 1929, and in 1933 when the German Aerztebund amalgamated with the Hartmannbund he was elected their joint president. Later he was appointed Reichsärzteführer. He took an important part in drawing up the Reichsärzteordnung of 1936 which fixed the rights and duties of the doctor in National Socialist Germany.

1. Gundersen, A. H., *J. Amer. med. Ass.* March 4, 1939, p. 833.

LECTURES IN HOSPITAL ADMINISTRATION.—A three months' course of lectures and demonstrations on clinical practice and hospital administration will be given by Dr. J. V. Armstrong at the Brook Hospital, Shooters Hill, Woolwich, S.E.18, on Mondays, Wednesdays, and alternate Saturdays, beginning on April 17. Further particulars may be had from the medical officer of health of the London County Council, Public Health Department, County Hall, S.E.1.

SPECIAL ARTICLES

THE BARCELONA BLOOD-TRANSFUSION SERVICE

By F. Duran Jorda, M.D.

LATE CHIEF OF THE BLOOD-TRANSFUSION SERVICE OF THE SPANISH REPUBLICAN ARMY

The blood-transfusion service in Barcelona began to function in August, 1936, and carried on till January, 1939. The technique invented by it was instituted throughout the whole of the republican army. The organisation was devoted to the performance of blood-transfusions on a large scale—i.e., to the problem of providing as large an amount of blood as possible to meet the requirements of an army. The solution of this problem is the establishment of an organisation dedicated to the preparation of stored blood in a large town. Any organisation that tries to solve the problem by the use of fresh citrated blood or by direct transfusion from donors is likely to fail, because in a rush of wounded it is impossible to give all the required transfusions, both on account of their number and the amount of blood required. The only solution is a stock of well prepared and preserved blood. Even Tzanck, of Paris, a great believer in direct transfusions, modified his technique in September, 1938, and adopted ours for use in case of war. Not only must a service of blood-transfusion of citrated and stored blood be organised, but it must be established in a large town where the altruistic spirit of the citizens can be aroused and organised so that they volunteer as donors.

ORGANISATION AND EXAMINATION OF DONORS

A main object of a blood-transfusion service is the proper organisation of donors; thus in 2½ years of work we never at any time failed to obtain donors, and we prepared from them 9000 litres of blood. The organisation of donors is threefold: by groups in (1) work-places and clubs, (2) small towns and villages round the city, and (3) districts of the city. With this triple organisation the service can mobilise many donors at any moment and yet preserve the secrecy of military movements. The Barcelona service included 28,900 donors, whose blood was classified in September, 1938, as follows:—

Blood-group	Number and percentage
IV–O	9190 (41·54)
II–A	10,080 (45·57)
III–B	2071 (9·36)
I–AB	779 (3·53)

The donor's blood must be examined as regards its agglutinins and agglutinogens. A blood-count should be done and the hæmoglobin estimated. The Barcelona service instituted its own technique for this study. The blood was studied serologically, two reactions at least being tried for syphilis, one based on deviation of complement and the other on flocculation. The examination was completed by an inquiry into pathological antecedents and by a clinical examination (radioscopy, urine, reflexes). In Barcelona we made a systematic study of the physical type (Kretschmer) of the donor, who was also required to fill up a psychological questionnaire (Bernreuter's "personal inventory"). All the data acquired from these investigations were divided into three parts: one part relating to the transfusion service and the other two to anthropological and psychological studies.

EXTRACTION AND PREPARATION OF BLOOD

Biologically, the blood should be prepared in the following manner: citrate should be added in the proportion of 4 in 1000 and glucose 1 in 1000. The solutions should be made with fresh doubly-distilled water.

The *extraction of blood* must be carried out with the greatest of care. In Barcelona we bled 150 donors in two hours, obtaining 25–30 litres of blood an hour. The technique must comply with both surgical and bacteriological rules. Blood is aspirated by suction (fig. 1), which must be so regulated as to avoid collapse of the donor's vein and consequent cessation of flow. The donor's arm must be perfectly sterilised and the selected area protected with a sterile towel. All the material is sterilised in an autoclave, except the needle, which is kept immersed in ether. The donor has to be bled fasting, so as to avoid post-prandial colibacteræmia; excess of fat, glucose, and protein; allergens of alimentary origin that occur sometimes in blood-plasma during digestion; and incompletely broken-down amino-acids due to hepatic insufficiency or to too large an intake of certain foods.

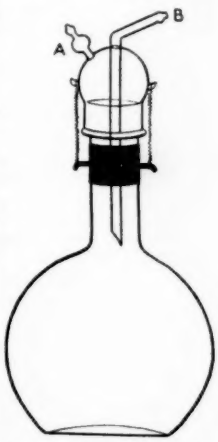


FIG. 1—Apparatus for collection of blood: A, valve through which suction is exerted; B, tube for entry of blood.

Filtration.—Our technique by which we systematically mix bloods of the same group necessitates the rigorous determination of the blood-group at each bleeding, as regards both agglutinins and agglutinogens. Immediately after this has been done we filter the blood. Our method automatically allows us to filter the blood and to fill the tube in which the blood will be stored for transfusion (fig. 2). Since the whole operation of filtering the blood and filling and setting up the tubes takes only half an hour, there is no risk of hæmolysis due to chilling of the blood; and by immediate filtration after extraction we avoid hæmolysis such as takes place when blood is kept on ice a few days and loses to a greater or lesser extent the resistance of its corpuscles.

Mixed blood of same group.—All the procedures used in ordinary clinical blood-transfusion are limited by the quantity of blood to be used, since all are done with only one donor. Yudin's method of using cadaver blood is useless when large quantities of blood are needed (in September, 1938, we prepared 832 litres of blood), for its efficacy is limited by the difficulties attending the collection of blood and by the need for all samples to be of the same blood-group. Our solution of the problem of obtaining sufficient blood was to mix all bloods of the same group, and our experience of thousands of transfusions has amply confirmed the value of our technique. The only theoretical biological limitation was the possible presence of the secondary agglutinogens (Landsteiner's M, N, and P). However, it has been shown in practice by all those who are specialists in transfusion and by us that these agglutinogens have not the power to sensitise human beings. With our

technique we have given to the same wounded man sixteen transfusions consisting of 4800 c.cm. of blood from ninety-six donors, at sufficiently long intervals to produce sensitisation, without producing any signs of intolerance. We had many patients who had four or five transfusions.

The mixture of bloods of the same group gives the following advantages. First, a very homogeneous blood (biologically speaking) is obtained, with a normal quantity of cells, hæmoglobin, glucose, urea, and other constituents, and the product of the mixture of several bloods tends to approximate more nearly to ideal blood. Secondly, a great biological advantage is obtained which deserves some attention. If we make a quantitative study of the agglutinins of multiple blood, we find that normally the blood has an agglutinin value of about 1/8—very rarely 1/32–1/64. We have never found 1/100 or 1/200 (reported by other authors). Now, if the normal figure is below 1/32, the product of mixed bloods will show a still smaller figure. This fact, as shown by our researches, allows the use of group IV blood for all wounded, even in large quantities, without fear of reactions due to inverse agglutination. This phenomenon may occur when a very anæmic patient not belonging to group IV is transfused with group IV blood, and it is due to the reaction between his agglutinogens and the agglutinins present in the group IV serum, if these are of high titre. The Russian school says that this is possible when the agglutinating power of the transfused blood is greater than 1/30.

Our experience of transfused patients, when the surgeon has not wished to operate because of the moribund condition of the wounded man, is that there is no inverse agglutination when our technique is used, and that it is possible to give 3500 c.cm. in one transfusion with universal blood to wounded men of another blood-group. Two wounded men of blood-group II–A were transfused with 3500 c.cm. of blood of group IV–O, and one man of group I–AB was transfused with 2800 c.cm. of universal blood in two transfusions, and there are many cases of wounded men belonging to other groups who were transfused with smaller quantities of universal blood. We can conclude therefore that no clinical accidents can be attributed to the secondary agglutinogens, and that the mixture of bloods is highly beneficial because it gives a more normal blood and removes the danger of inverse agglutination.

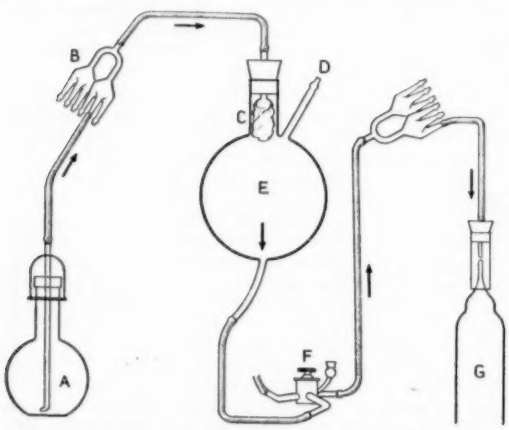


FIG. 2—Apparatus for filtration of blood and filling of tube shown in fig. 3: A, flask containing blood; B, key to which six flasks can be attached; C, silk filter; D, tube for maintaining vacuum in flask E in which blood is mixed; F, tap for control of entry of blood and for maintaining vacuum in tube G which is shown in detail in fig. 3.

POINTS OF TECHNIQUE

Every method of transfusion, to be perfect, must fulfil three conditions: the possibility of transfusion in any place whatever, at any moment whatever, and by any member of the medical personnel. Our technique has completely fulfilled these three conditions. The apparatus consists of a sealed glass tube containing blood under a pressure of two atmospheres exerted by filtered air. This pressure is the force that drives the blood into the veins. It has no action on the blood—i.e., it cannot alter the constituents of the blood. The action is exactly the same as that of the atmospheric pressure in mines or diving-bells.

Automatic bacteriological control is the most important part of our method and is what has without doubt placed it at the head of all other methods. Physiologists have shown that a pressure of 16 mm. Hg is enough to convert 99 per cent. of the hæmoglobin to oxy-hæmoglobin if the blood is in contact with oxygen. This action takes place in our tube owing to the amount of oxygen in the air. All the blood pigment is changed to oxyhæmoglobin and the blood becomes a ruby red.

If the blood is accidentally contaminated, the organisms will not grow unless they are aerobic, because the growth of anaerobic organisms is inhibited by the oxygen in the tube and by the intense oxygenation of the blood. The growth of aerobic organisms will take place at the expense of the oxygen in the tube, and, since the tube is sealed, the oxyhæmoglobin will be reduced and the blood change from ruby red to dark red, thus showing that the blood is not sterile. If the bacterial action proceeds further, the blood pigment alters to hæmatoporphyrin and the blood turns black. This fact is fundamental to our technique and allows us to control the sterility colorimetrically.

Increase of cellular resistance.—The intense oxygenation of the blood doubtless produces an increased vitality of the blood-cells, as shown by their greater resistance to hypotonic solutions of sodium chloride. This fact is well known to the Russian school, who advise the addition of 1·2 c.cm. of hydrogen peroxide to every 100 c.cm. of stored blood.

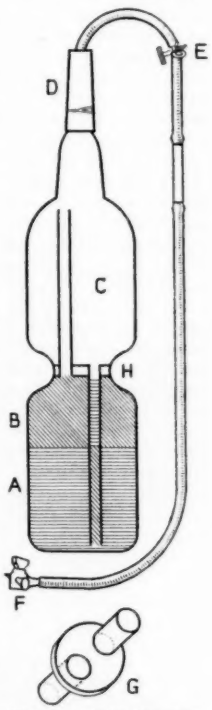


FIG. 3—Tube for storage and administration of blood: A, sediment of red cells; B, plasma; C, compressed air; D, sealed capillary end of tube in rubber tubing; E, screw clip to control flow of blood; F, two-way cock; G, arrangement of small tubes in glass partition (H) dividing the tube into two chambers.

FIG. 4—Photograph showing method of mixing corpuscles and plasma before transfusion.

Increase of bacteriolytic power.—The Russian school increase the bacteriolytic power of the blood with hydrogen peroxide. This, like the increased cellular resistance, is effected by our technique per se without the addition of hydrogen peroxide.

Impossibility of hæmolysis due to transport.—The tube used by us for transfusion and transport of the blood is constructed in such a way that there is no free surface of blood. Every movement transmitted to the tube is propagated throughout all the blood. No oscillation or wave-action is set up, and there is no splashing of blood against the sides of the tube. Thus the blood is not shaken up and the red cells cannot become hæmolysed. This container is the only one that safely prevents the hæmolysis due to transport of the blood.

The tube consists of two compartments that communicate one with the other through two narrow glass tubes (fig. 3). The compartments are separated by a glass partition which prevents there being any free surface of blood. A glass tube runs from this partition to the top of the tube, and another from the same partition to the bottom of the tube. Blood is drawn into the upper chamber by creation of a vacuum and falls by gravity into the lower chamber through the narrow glass tube. Since the whole lower chamber is finally filled with blood, shaking of the tube causes little, if any, movement of the red cells. After blood has been passed into the lower part of the tube the upper part is filled with compressed filtered air and the capillary tube sealed. On standing, the red cells in the lower chamber sediment, leaving a clear layer of plasma above. Turning the tube upside down produces immediate and perfect suspension of red cells, and this should be done before every transfusion (fig. 4). The tubes allow of perfect observation of the state of the plasma and the degree of hæmolysis of the contained blood.

Method of transfusion.—The tube is prepared for use complete with the necessary apparatus required for administration of blood. A venepuncture having been made with a needle attached to the two-way cock shown in fig. 3, it is only necessary to break the capillary neck of the tube for blood to be driven into the vein by the pressure of air present. A correct venepuncture is facilitated by attaching a small syringe to one side of the two-way tap. The syringe can first be connected with the venepuncture needle by this tap, which, after it is clear that the vein has been entered, can be turned to connect the needle with the tube containing blood, and the syringe can be removed.

The following points should be noted:—

(1) The sterility of the blood must be observed as shown by the colour—ruby red for sterile blood; dark red or black for infected blood.

(2) Estimation of the vitality of the blood by observation of the degree of hæmolysis. If the tube is kept vertical and sedimentation has taken place, it is easy to see the overlying plasma and to note its colour. The plasma should be amber and not red. A note should also be made as to whether the line of division is evident.

(3) The blood must be mixed by inverting the tube.

(4) The blood must be carefully heated to 45° C. in a water-bath. The temperature must be exact. If the water-bath is too hot, hæmolysis of the peripheral parts of the blood may take place. If the correct temperature is not reached, there may be severe reactions in the transfused patient.

STORAGE AND TRANSPORT

The blood is stored in refrigerators at 2°–4° C. The Barcelona institute had its own means of transport to enable the blood to be taken to the required place with the greatest safety. There were two lorries and a railway van, each fitted with a refrigerator. Advanced military posts were provided with refrigerators which functioned well either by electricity, petrol, or paraffin. For transport to places which could not be reached by vehicles the blood was carried in isothermic cases supplied with a refrigerating mixture.

ORGANISATION OF INSTITUTE

The institute at Barcelona had a complete organisation for following up the results of each transfusion and the exact fate of each tube. A card was made out for each tube and another for each transfused patient in addition to his clinical history.

At the end of January, 1939, the institute had obtained 9000 litres of blood as a result of 20,000 withdrawals and prepared more than 27,000 tubes. A list of 28,900 donors well studied and classified was available. The institute further took over the preparation of all the sera necessary for grouping; the plasma of group I–AB and group II–A for the hæmostatic treatment of hæmoptysis, hæmatemesis, and hæmorrhagic states; and antipoliomyelitic and antityphoid sera from cured and convalescent patients. One whole section was devoted to the treatment of measles, scarlet fever, smallpox, and other fevers; and after a time the institute also took over the investigation of paternity and the study of agglutinogens and agglutinins in bloodstains. Finally a section was instituted for experimental biology. Such was the institute that grew up out of the blood-transfusion service in Barcelona, and a similar institute, wherever established, will be able to render great help not only in civil practice, but also in time of war.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—The King's Fund has decided, in view of the increasing complexity of hospital services, to supplement its annual publication of hospital income and expenditure by an advisory service which will, it is hoped, enable individual hospitals more easily to take advantage of the experience of others. The fund has appointed Captain J. E. Stone, at present secretary of the Birmingham Hospitals Centre, to its staff from June next.

A STATE MEDICAL SERVICE

DEBATE BY FELLOWSHIP OF MEDICINE

ON March 24 the Fellowship of Medicine held a debate at University College, with Mr. HERBERT PATERSON in the chair, on the motion "that the institution of a whole-time State medical service would be in the interest of the nation's health." *

Mr. SOMERVILLE HASTINGS, proposing the motion, explained that the service he had in mind should provide every kind of care and treatment. It should aim also at prevention, and should therefore be linked up with the preventive services. It should be free of charge, open to rich and poor, and staffed by whole-time officers. It must be attractive to doctors and patients. Private practice would be permitted, but as more and more doctors joined the service it would be progressively superseded. The service must be introduced gradually, but there was no reasonable stopping-place between the first incursion of the state into preventive medicine and a complete state service. Prevention meant treatment, and treatment meant diagnosis. The great improvement in the public health during the last fifty years had come about largely through coördinated, coöperative preventive effort; there was an incipient public demand for the extension of those methods into the realm of treatment. At present disease was neglected in working-class homes through lack of money. Early diagnosis could only be made in free centres.

Dr. D. STARK MURRAY, seconding, assumed that everyone agreed that the present position was deplorable. The health of the nation could, he declared, only be improved by radical changes, extending to interference with the environment of the healthy. The British Medical Association refused to face the facts it had itself found, and its scheme perpetuated the worst features of the present services. The problem must be considered as a medical one and freed from the economic barrier. An ideal medical service must be flexible and adaptable to variations in the population and the incidence of disease. The arrangements must be sufficiently uniform to allow staff to be readily interchanged and as good service to be given at Land's End as in the City of London. The present uncertainty, financial difficulty, and lack of opportunity for research and study could only be obviated in a whole-time salaried service.

Sir HENRY BRACKENBURY opposed the motion. He said that Mr. Hastings ignored the preventive work that private practitioners did every day. It was neither good nor necessarily effective for the state to do everything for everybody; the responsibility lay also with the doctor and the individual citizen. The state should not provide free services for those who were well able to provide them for themselves. The attempt to do this was bringing Australia and New Zealand to grief. The increase in the expectation of life of the average citizen was not mainly due to the public preventive services. There was no reason why the state, having assumed a part of the public-health service, should necessarily go on to assume the whole. The mover seemed to think that the doctor's whole business was to discover, label and eliminate some disease existing as an entity within the human body. He would divide his service into departments according to diseases, each with its army of whole-time officials, and bring in the general practitioner presumably to sort out the resulting muddle.

The doctor dealt primarily not with a disease but with a patient, and should be to his patient not merely a disease-discoverer but also a health-adviser, a sympathetic helper and an understanding friend. The general practitioner must therefore be the basic factor in a medical service. The principle might be best described as free contract, and the essential conditions were spontaneity, freedom and continuity. Neither the profession nor the public would tolerate regimentation. Under a whole-time state service the doctor would tend to place first not the interests of the patient but the wishes of the body that appointed him or of his superiors in the hierarchy of the service. The patient would to a large extent become the patient not of his doctor but of the service. In spite of the advantages of a state service to the doctor, few family practitioners would willingly give up the satisfaction brought by helpful participation in their patients' joys and sorrows, responsibilities and difficulties. He preferred a free-contract service —arranged by the state if need be—to a salaried official service; a whole-working-life service to a whole-time service; and a human service to a regimented service. A general medical service should be something more than a gigantic machine for grinding out the public health.

Dr. FRANK GRAY, seconding the opposition, said that a patient had a good idea of the sort of treatment he was getting from a general practitioner, and if he was not satisfied did not hesitate to go to someone else. Government departments were not notably concerned with providing first-rate service but rather with appearance and cheapness, as in free education, and with evading trouble. A patient would not take intimate personal problems to an impersonal government service. "Coördinated and coöperative effort" in the L.C.C. maternity and child-welfare services meant at present that a woman and her child passed through a series of unrelated departments. In case of emergency at night none of these was available, and she had to call in her private doctor, who knew nothing about the previous history. Since 1911 the only efforts to provide instruction in preventive medicine had been made by two groups of London doctors and not by the Ministry of Health. No more damning indictment of a government department could be framed. Disease in one member of a family affected all the others, and the family doctor was indispensable.

The debate having been thrown open by the Chairman, Mr. JOHN BUNYAN said that under National Health Insurance the dentist was not allowed to give the treatment he considered necessary, but was dictated to by an insurance society—the greatest racketeer of today. A state service would never succeed, for it would be inflexible and would stultify any new ideas.

Dr. D. CLARK expressed the need of the general practitioner for help in his frequent rush times and for leisure and opportunity to keep in touch with advances in medicine. These could be provided only by making him a member of a service.

Dr. GERALD SLOT computed that 40,000,000 of the population were either panel patients or dependants. The remainder available for the doctors who were not of the panel class was only about 5,000,000. Most doctors received money from state sources, and most said they felt happier under the panel system than they had under the old days of contract practice. Their complaint against the panel was that its facilities did not reach far enough. A patient who went to hospital had no free choice of doctor; nor, practically speaking, had those who lived in a rural area.

* A verbatim report of the debate will appear in the April issue of the *Postgraduate Medical Journal*.

Dr. G. DE SWIET said that some doctors would not mind trying a state medical service if they were assured that they would not have their practices expropriated without just compensation. He had been connected with a satisfactory service which had been domiciliary, open to patients within wide income limits, and run largely by the doctors themselves without interference from friendly societies.

Dr. H. H. MACWILLIAM thought that the work of the doctor of ordinary ability and character would be more productive under some form of whole-time service than under the present chaotic conditions. Doctors did better work when free from the necessity to earn money by piece-work. To found the state medical service on the municipal hospitals would meet all the criticism that had been expressed.

Dr. E. M. DIMOCK blamed the B.M.A. plan for doing nothing to improve the efficiency of the individual. A state service would give the doctor many more contacts, and opportunity for self-improvement.

Dr. C. F. T. SCOTT saw in the advocates of the motion a "mid-European" confusion of thought and a belief that bricks, mortar and good bureaucratic policing could replace personal contact with the patient.

MEDICINE AND THE LAW

Damages for Contracting Undulant Fever

IN the case of Harmer *v.* Cornford, tried at Lewes assizes recently, the plaintiff obtained £195 19*s.* 2*d.* damages on the ground that he had contracted undulant fever through drinking milk supplied from the defendant's dairy. Plaintiff's counsel explained to the court that this disease resulted from drinking the milk of cows suffering from contagious abortion. Undulant fever, he said, was not commonly in the public notice, but was being diagnosed now with greater frequency as the medical profession realised its seriousness and its symptoms. A significant symptom was a recurrent rise of temperature every evening: this occurred in mild forms of the illness: in a severe form the illness was often fatal. Mr. Harmer was treated by his doctor for a feverish chill without improvement; when he went into hospital for an operation for hernia, it was not possible to operate because of his temperature; undulant fever was then diagnosed. The plaintiff was one of many people at Bexhill who drank milk supplied by Mr. Cornford; as in the water-borne epidemic at Croydon, many were exposed to the risk without ill effect. Medical evidence established that this fever could be contracted only from milk or contact with farm products; Mr. Harmer's infection was probably due to his drinking milk in the morning undiluted and unheated; about 500 cases were reported yearly; the number was increasing with better recognition of the disease. The only method of eliminating the germ, it was said, was pasteurisation. Statistics appeared to show that women were less often infected than men and that children were almost immune. A veterinary surgeon said that the defendant's herd was perhaps a little cleaner than the average; as soon as the diseased cow was detected, it was isolated.

The plaintiff's case was framed in two ways. It was based on the alleged negligence of the defendant; but Mr. Justice Charles ruled that there was no evidence of negligence. Alternatively it was based on an alleged warranty that the milk supplied was fit for human consumption. The Sale of Goods Act, 1893, which embodied the existing common law, implies the existence of such a warranty. The seller of unfit food may also be liable to a penalty under section 3 (1) of the Food and Drugs Act, 1938, which reproduces the now repealed section 2 (1) of the Food and Drugs (Adulteration) Act, 1928. This additional complication, it may be recalled, was examined not long ago by the Court of Appeal in Square *v.* Model Farm Dairies (Bournemouth) Ltd., where there was a question how far the liability to a statutory penalty excluded liability to pay damages to a plaintiff. This question did not arise in Harmer *v.* Cornford; in these cases of implied warranty the liability of the defendant to pay damages is almost absolute. Mr. Justice Charles observed that the plain fact was that Mr. Cornford contracted to supply milk that was fit to drink, trying as hard as he could to do so, but failed. The judge said there was no reflection upon the dairyman or his dairy, which appeared to be carefully conducted. A Brighton pathologist, giving evidence for the defendant, had said that the purest milk might contain the germ; the proportion of members of the public affected by undulant fever after drinking ordinary milk was perhaps 1 in 100,000; the disease could easily be mistaken for many others, such as influenza and paratyphoid. Another expert witness had said that the effect of making it compulsory for milk to be free of this particular germ might be to withdraw 40 per cent. of the milk available for human food. The learned judge thereupon interjected the light-hearted comment that, if this happened, we should all have to take to beer. An alternative, as we have said before, is insistence on efficient pasteurisation.

AUSTRALIA

(FROM OUR OWN CORRESPONDENT)

SCIENTISTS AT CANBERRA

OVER 1100 delegates attended the biennial meeting of the Australian and New Zealand Association for the Advancement of Science which was held in Canberra from Jan. 11 to 18. Overseas visitors included Prof. F. T. Brooks, Prof. Ralph Carr, Dr. Anita Mühl, Sir E. John Russell, Prof. N. V. Sidgwick, Sir John Flett, Sir George Simpson and Mr. H. G. Wells. The inclusion of sections of history, economics and social science, education, psychology, and philosophy is a welcome indication of the present tendency to extend the application of scientific thought and method to fields other than those usually recognised as pure science. In spite of this, the congress was perhaps disappointing in that no constructive recommendation of any social significance emerged from it. One two-hour discussion on Science and Society represented the sole official attempt to relate the discoveries of science to the experiences of our daily lives. However, one of the less obvious advantages of any congress of this nature is the opportunity it provides for personal contact between experts in different fields and consequently for the coördination of effort and integration of ideas.

PHYSICAL FITNESS

In his presidential address to the medical section, Dr. E. Sydney Morris, director-general of public health in New South Wales, said that although the average Australian compared favourably in physique with the average person of other countries, he fell short of what was possible considering his natural advantages. Under modern conditions physical

activities were subordinated to intellectual functions. It was necessary to establish equilibrium between mental and physical effort. While universal state education was enforced by law, the maintenance of physical health was left largely to the individual. Provision was necessary for the needs of three groups: children of pre-school and school age, adolescents, and adults. Effective medical supervision was necessary to protect undernourished or otherwise handicapped children against unsuitable exercises. To make any organisation generally effective full advantage would have to be taken of the press, broadcasting, and other methods of propaganda. Success would also depend on the organisation of leisure time so that the advantages of physical education could compete with commercial forms of entertainment.

Dr. Fritz Duras, director of physical education at the University of Melbourne, pointed out that physical fitness implied something much wider than fitness for games or exercises. It should be approached through central research institutes, where the effects of various kinds of exercise on different representative types could be studied. With this should be associated the training of teachers, who would be responsible for the third stage of the process—the application to the community of the results obtained. (The Council of Physical Fitness is asking the federal government to provide lectureships in physical education and the necessary equipment at each of the Australian universities, at a cost of £12,000 a year.) Dr. Duras also discussed the radiological measurement of heart size after various types of exercise. He had found that heart size decreased during static work, increased during moderate dynamic work, and increased only slightly, if at all, during more strenuous work. After exercise the size of the heart fluctuated about a continually increasing mean, and might not return to pre-exercise measurement for 48 hours.

In measuring the maximum physical work of which human beings are capable Dr. F. S. Cotton (Sydney) had found that champion cyclists can put out over half a horse-power for five-minute periods. This is materially higher than that previously recorded for Olympic oarsmen, in spite of the fact that their figures included a somewhat arbitrary allowance for work not used in propelling the boat.

Dr. E. A. Machin, principal medical officer to the education department of New South Wales, suggested that many school-children develop uneven shoulders because of the over-use of their right hands. In a survey last year of over 16,000 children attending state schools in New South Wales it was shown, he said, that 34 per cent. of boys had uneven or dropped shoulders. A heavy school-bag carried in the same hand every day will tend to pull the shoulder down, but this is by no means the only cause of dropped shoulders. They are associated with the general one-sided development of the shoulder-girdle muscles. The survey also showed a high correlation between wrongly designed footwear and deformities of the feet. Of the children examined 77·3 per cent. had only slight medical defects or none; 20·4 per cent. had remediable, including dental, defects; 1·9 per cent. had permanent but not seriously incapacitating defects; and 0·4 per cent. had defects causing permanent serious incapacity. Posture was good in 27 per cent.; average in 43 per cent.; below average in 26 per cent.; and poor in 4 per cent.

An examination of the food of public-school boys was discussed by Dr. H. S. Halcro Wardlaw, lecturer in biochemistry at the University of Sydney. He showed that the consumption of building substances increased with the boys' weight, while consumption of energy foods increased more slowly and in proportion to surface area. Expressed in adult-male units the group had an average daily consumption of 2600 calories, made up of protein 95 g., fat 100 g., carbohydrate 352 g., and mineral matter 19 g. The group studied were taller and heavier than a comparable group of state schoolboys, and were very similar to a comparable group of English boys. The English schoolboy however has a total energy consumption about 10 per cent. greater than that of his Australian prototype. This difference is attributed to difference in climate.

NATIONAL INSURANCE ABANDONED

The federal government has now decided to abandon completely its national-insurance scheme. In a desperate attempt to preserve the plan, even if only in skeleton form, several less comprehensive schemes were considered, but a clear majority of the cabinet favoured the complete abandonment of the act. This decision is understood to have been come to, first, because of fear that the financial burden involved might stifle normal developmental expenditure if it fell simultaneously with the heavy defence programme and while the greater part of the Commonwealth is suffering from the effects of severe drought and widespread bush-fires; and secondly, because the act is highly unpopular throughout Australia, and its introduction against the wishes of the people might lead to grave political consequences. The opposition to the scheme in the ministry itself, though strong when Parliament adjourned in December, has increased immensely since. In the past two months members of the cabinet have moved freely in their electorates and have been astonished at the intensity of public feeling against national insurance. The abandonment of the scheme will render useless the considerable sums already spent on organisation and administration. Already 156 approved societies have been formed, 60 by trade-unions, 59 by friendly societies and 37 by miscellaneous organisations. These societies have incurred heavy expenditure in providing office accommodation and furnishings, in anticipation of the full operation of national insurance in September, and many men have left lucrative positions to take administrative posts with the societies. It is to be hoped that it will be possible to introduce a modified scheme when the nation is better prepared to handle developmental measures.

PARIS

(FROM OUR OWN CORRESPONDENT)

ARRANGEMENTS FOR VISITING DOCTORS

AT the annual meeting of the Association pour le Développement des Relations Médicales (A.D.R.M.) the founder and tireless leader of this organisation, Prof. Hartmann, reviewed its many activities during the past year. No fewer than 3252 persons were received in the offices of the association, and some 2000 requests for information and so on were made by letter. The association also gave its assistance to groups of doctors visiting Paris from England, America, and other countries, and arranged for some 80 students from abroad to exchange with French students and come to France for a month during their holidays. The association has also given wide publicity abroad to the educational facilities available

at certain French provincial medical schools, such as those of Montpellier, Strasbourg, Nancy, Bordeaux and Lille, and has made arrangements with a reliable American publisher for the reproduction of French works abroad. Not the least important of its activities is the organisation, in coöperation with the American Medical Society of Paris, of postgraduate courses in English this summer under the auspices of the Paris Faculty of Medicine. A list of these courses, with information as to where to go and what to see, may be obtained from A.D.R.M. Salle Béclard, Faculté de Médecine, 12, rue de l'Ecole-de-Médecine, Paris.

PROSECUTION OF THE DIRECTOR OF AN UNAUTHORISED PRIVATE ASYLUM

Article 5 of the law of June 30, 1938, requires official authorisation of anyone conducting a private asylum in which the personal liberty of the patients is restricted. This law was recently invoked at Nantes, when a certain doctor was prosecuted for having treated patients in an institution not recognised by the authorities as an asylum. The defendant claimed that his hospital had been run as an "open" or "free" institution, and it had not therefore been affected by the law of June, 1938. He insisted that he had never admitted mental patients dangerous to themselves or others, and requiring restrictive measures in the interests of public order. His patients had, indeed, only been subjected to such supervision and protection as was required for their treatment or was needed for the maintenance of discipline in the establishment. But according to the evidence of the prosecution, some of his patients were definitely insane. And undoubtedly two of them had committed suicide while in this institution. The heaviness of the fine imposed on the doctor in this case for having contravened the law doubtless reflected the determination of the authorities to discourage the running of private asylums by undesirables. A trivial case in itself, perhaps. But it is a sign of the times and of the tightening by the central public-health authorities of the control of the practice of medicine throughout the country.

ATTENDANCE AT ROAD ACCIDENTS

The report of the Union Nationale des Associations de Tourisme for 1938 includes an account of the system adopted for dealing with casualties on the roads. The U.N.A.T. has organised 2408 first-aid posts at the most frequented points on the French main roads, and has put in charge of each someone of good character and with a sedentary occupation, such as the keeper of a public-house, a garage or a small shop, who can be counted on to be on the spot, particularly on the days when road traffic is greatest. These people are not salaried, but are given 15 francs for every notified accident to cover telephone and other small expenses. Their outfit includes two sets of forms and a list of approved doctors. On one form they must notify the U.N.A.T. of any accident within 24 hours. The other form is for the doctor who, if his account is not settled forthwith by the patient, sends a claim for 50 francs on this form to the U.N.A.T. The Union then pays the doctor 40 francs and retains 10 francs to cover failures to obtain the fee from certain patients. When a doctor finds a colleague already in medical charge of a road accident, he puts in a claim for 25 francs and receives 20 francs from the U.N.A.T. This scale of charges has been found in practice to be satisfactory. During 1938 the first-aid posts of the U.N.A.T. notified 2402 accidents to 3386 persons, 151 of whom were killed. In 1937 the corresponding figures were 2439 accidents, 3376 victims, and 123 deaths, so that although there was little change in the number of accidents there was a considerable rise in the number of people killed.

IRELAND

(FROM OUR OWN CORRESPONDENT)

A HOSPITALS BILL

THE Hospitals Bill, 1938, which has given rise to certain apprehensions on the part of those interested in the voluntary hospitals, has now passed both houses of the Oireachtas. On the face of it, it appears to be an innocuous and possibly useful measure, but it has some dangerous possibilities. It provides that, on the application of the governing body of a voluntary hospital and with the consent of the local authority, the Minister for Local Government and Public Health may issue an "establishment order" in respect of such hospital which will have the effect of putting the hospital under the control of the local authority. Hitherto such a change of control required the authority of an act of Parliament in each case, and two such acts were passed in recent years, dealing with fever hospitals in Dublin and Cork. It was stated that two maternity hospitals—one in Cork and one in Limerick—were anxious to obtain similar change in their status, and that the bill was introduced to avoid the necessity of special legislation in these and other cases in the future. In criticism of the measure it was pointed out, both in the Dáil and in the Senate, that an apparently harmless bill proposed to transfer important powers from the legislature to a government department, and that there was danger of the bill being used in the future to exercise undue pressure on a voluntary hospital. Since the sweepstakes were established voluntary subscriptions have dwindled greatly, and most of the hospitals depend on grants from the sweepstakes funds to meet their annual deficits. As the sweepstakes funds are in the control of the Minister for Local Government and Public Health, it is easy for him to exercise such pressure as will compel a voluntary hospital to ask for an "establishment order." A pledge was given by the Parliamentary Secretary, who was in charge of the bill, that no financial pressure would be exercised by the Minister in such a case. In reply it was pointed out that such a pledge was good so far as the immediate future was concerned, but was of no avail in binding the successors of the present Minister.

SWEEPSTAKE DRAW

In opening the draw of tickets for the sweepstake on the Grand National steeplechase, Viscount Powerscourt announced that the sum to be made available for the hospitals would be £446,456. The total sum accruing to hospitals from the twenty-six sweepstakes that have now been held has amounted to £13,447,763.

CENSUS REPORT

Another volume of the detailed reports of the census of the Irish Free State of 1936 has just been published. It deals with ages, orphanhood, and conjugal conditions, classified by area only. It is entitled Volume V, Part I, but is in fact the second of the entire series of volumes to be published. Great care has been taken to make the record of ages as accurate as possible and to avoid the weighting which

on previous occasions occurred on the ages ending in "0" or "5." Two facts stand out from the returns: the trend to an ageing population and the late age of marriage. For example, the number of persons under twenty-one years of age has diminished by 47,000, or 5·4 per cent., between 1926 and 1936, while the number of persons over fifty-five has increased by 52,000, or 10 per cent. In regard to marriage it is shown that of persons of the age-group 25–29 no less than 82·3 per cent. of the males and 64·1 per cent. of the females are single, while of the entire number of persons over fifteen no less than 56·8 per cent. of the males and 47·2 per cent. of the females are single.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM AN ONLOOKER

I

To hear people talk, one would imagine that doctors are just ordinary men and women with a technical training. If true, this is a revolution. For hitherto we have been something more; indeed something different: we have been members of a profession with a code of rules dividing us from ordinary men. The object of these rules, I take it, was to break down the hesitation a person might feel in consulting an ordinary neighbour, however skilful; and that is why we were supposed to respect confidences, abjure prejudice against particular races, classes or opinions, and pretend not to mind about money. Anyone abiding by such rules is far more to his clients than a medical expert: the original simple relation of man to man is superseded.

The right and proper relationship of doctor and patients seems to me to deserve closer attention than it gets from most of us; for it is, or should be, the basis of all opinions on medical organisation and the future of the profession (*pace*, of course, Herr Hitler).

In what we call the traditional relationship the doctor plays three parts, with varying emphasis: he is a money-earner; he is an expert; and he is a kind of father-substitute. He is also a citizen, with a citizen's obligations; but as he tends to think the laws of society less binding than the laws of his profession he is less than other men a servant of the state. This traditional relationship, established through the centuries, could be seen in fairly pure form in many an English town and village until quite lately. At its best it was profoundly satisfactory, for the man entrusting himself and his family to a capable practitioner had little reason to doubt either his loyalty or his knowledge. The doctor, it is true, might put "professional etiquette" above the interests of a particular patient; but the upshot was likely to be the same, for the code itself insisted that the patient's interests should be considered before all others. As for the adequacy of the help given, the whole range of necessary knowledge was held to be within a single doctor's comprehension; and although a second opinion would no doubt be invoked in emergency the basic fact was that the practitioner accepted full responsibility from birth till death and to the limit of his strength and skill.

All this, it may be said, is unchanged in 1939; and it is true that the doctor still combines three parts as money-earner, expert helper, and father. But the congregation of people into big cities, the strengthening of the social conscience, the intrusion (or benevolence) of governments, and the advance of scientific methods, have wrought immense changes in practice as a whole. Not only has the emphasis changed, so that it often rests more strongly on money-making; not only does expert help require division of labour and elaborate equipment; but also the doctor has acquired new rôles. He has now become to a greater or less extent an instrument of government, so that doctor and patient often face each other as state official and citizen; and he has become an instrument of research, so they may meet as scientist and "case." Unless we have clear ideas about the situation of the doctor as money-earner, expert helper, father, state official, and scientist, we are not really in a position to propose or oppose schemes for reorganising medical work.

* * *

The doctor must live and must have money to live with. He may be paid by his patients or he may be paid by someone else; but he must be paid. Even if he cares more for his work than for money his relations with his patients must eventually be coloured—and in fact they are deeply coloured—by the system on which his livelihood is secured.

In the modern community there are really only three ways of paying doctors: (1) by fees for each service rendered; (2) by capitation fees for each patient on the doctor's list; and (3) by a salary. Our incomes may be much the same whichever is adopted, for fees and salaries are alike based on a consensus of opinion about the standard of living appropriate for medical men and women. But though the annual totals in the pass-book may be the same the three ways in which they are reached are very different, and the doctor-patient relationship differs according to which is used. In private practice, as someone has put it, we depend for our living on the misfortunes of our friends; whereas with a salary or a capitation fee this necessity is avoided. Doctors in private practice or receiving capitation fees must try to attract as many patients as they can; whereas those with a salary need not please their patients if they can please their paymasters.

The three methods, with their important reactions on practice, arise from two political philosophies and a compromise between them; and those who plead for one or other often display the strong affective tone evoked by criticism of deep-seated beliefs. The cleavage of opinion is seen if we reflect for a moment on the present situation of medicine. What is happening is this: the demand for medical care has become greater than ever, but so has the cost of providing it; and a smaller and smaller proportion of people can afford to buy it at a price that makes its sale profitable. The current method of paying practitioners—the fee for each service rendered—has become a barrier that the patient cannot surmount and must try to circumvent. In such circumvention he is increasingly aided by the state, since efficient medical care is obviously in the national interest and must often be provided by the government if private enterprise fails.

The hungry peoples want bread but cannot have enough because no profit can be made from selling bread at a price they can pay: we call this starvation in the midst of plenty. The ailing peoples want preventive and curative medicine but cannot have enough where doctors must make a living from what they sell. Instead of being too ill to see the doctor, like the lady in *Punch*, they are too poor to see him; which is almost as ridiculous.

Surrounded, as we are, by examples of prosperous practice in contented communities, this sounds like an over-statement. I do not for a moment suggest that private enterprise does not still bring good returns and offer efficient service when conducted among the well-to-do. But the fact remains that it has now become definitely unprofitable to undertake efficient service among the poor. As medicine advances, the practitioner's training must be longer and his equipment more expensive. As medicine advances, there must be more specialists, and special and costly apparatus, for more elaborate investigation —and sometimes even treatment—of disease. The sick man can no longer be content with a single doctor, but often needs the aid of many, and of their machines. But only the rich can pay for the help that all these doctors are ready and anxious to provide, and the mass of the population does without the aid of scientific medicine or else gets it from semi-charitable or state-provided institutions.

In good times much money can still be earned by practising among the rich or by giving incomplete service to the poor, but there is more and more competition to secure the comparatively small number of fees that are genuinely remunerative. In bad times the less successful members of the profession have to do so much of their work for little or nothing—lest they lose it altogether—that they can no longer afford to live, or educate their children, according to their station. The production costs of medical care have made it too expensive for most of its would-be purchasers.

The state of affairs today is not of course essentially new. Always there have been large groups of people who could not possibly pay for their medical care—people among whom medical practice was unprofitable. All that has happened is that the rising cost of such care has enlarged these groups, so that they now include most of the middle classes. By no means paupers, these have become (as the Americans call it) "medically indigent," since their resources seldom suffice to meet the full cost of unexpected illnesses and operations, or even of adequate advice.

The new element in the situation is the growing assumption of medical responsibility by the state, which now employs a substantial proportion of the medical profession in filling the more obvious of the gaps left by the private enterprise of their colleagues and of charity. The more numerous the medically indigent become, the more this kind of provision increases, and the worse the outlook appears for the private practitioner.

* * *

Faced with financial loss, doctors, like other citizens, appeal to Cæsar. Either they say: The state must henceforward take care of everybody who cannot pay us properly (but not of anyone who can) so that we can go on practising at a profit as of old. Or they say: Let the state establish an economical medical service for the whole nation and pay us salaries for working it. In the United States the American Medical Association, taking the first line, is trying to preserve, and even enlarge, the field in which medicine can still be practised on a fee-paying basis. In Soviet Russia the second alternative has been chosen, and the benefits of medical science are to be given to all citizens in the same way, whether their wages are large or small.

Each of these two opposite policies is a reflection of the economic system of its native country. The United States are capitalist, and the capitalist who finds himself in low water demands that the state shall stop interfering with the natural working of capitalism—except that it must protect him from competitors. The state, the capitalist holds, may and should undertake the unprofitable tasks that are of national importance, but must give him a clear field wherever profits can be made. The American doctor realises that his fee-for-service system will not serve the whole community, but demands that no-one shall provide any other system for patients who are financially worth treating; private enterprise must be defended to the last. Soviet Russia, on the other hand, is a socialist country, and in a socialist regime the profit motive ceases to govern government, and the monetary contract between doctor and patient is abandoned on principle, whether it serves a purpose or not. Somewhere between these two extremes lies our own country—a capitalist state in which socialist and charitable measures have been used as a prophylactic against revolution; a capitalist stock bearing a socialist graft; a golden laburnum with branches of red hawthorn so big and flourishing that some mistake them for the tree itself.

According to British political philosophy the state may only interfere with industry reluctantly and at the last moment, to avert a breakdown; and it will usually subsidise a private enterprise rather than take it over. This distrust of fundamental changes and large planning, coupled with a sense for saving the situation, is seen in its relations with medicine. State and municipal hospitals and services were inevitable because no profit could be made out of a great mass of medical needs that cried to heaven for attention. But private enterprise was still regarded as the right and proper means of purveying medicine, and to secure its survival among the working-classes the Government arranged a national health-insurance scheme—with a subsidy from the taxpayer. The British Medical Association wishes to see this scheme extended as the basis of a Medical Service for the Nation. Meanwhile, however, the government and municipal medical services, though grudgingly established, have begun to attain the moderate efficiency of most of our other social enterprises, and so many doctors are already employed by them that they offer an alternative nucleus for a national service.

* * *

At the moment, then, the American doctor likes a fee from his patient, the Russian doctor likes (or has to put up with) a salary, and the English doctor is said by his representatives to prefer a capitation fee if he cannot get an ordinary one—but does not seem unready to accept a regular income. These points of view are what one might expect from the social and economic outlook of the various nations. But surely there is room for a little independence of thought among scientific and professional men? If our main object is (as it should be) to secure the best possible relationship between patient and doctor, and if this relationship differs (as it does) under the three systems, should we not try to base our preference on evidence and arguments rather than on political beliefs?

LETTERS TO THE EDITOR

MENTAL NURSING

SIR,—Dr. Pilkington's letter in your last issue emphasises a point that many people ignore—that mental nursing is something completely different from general nursing. A knowledge of anatomy and physiology is of very little direct value to the mental nurse since he has to deal with the patient as a personality and not from an anatomical or physiological point of view. At present the new probationer is thrust untrained into a ward which may contain anything up to one hundred insane people, some of them probably epileptics who may greet the newcomer with a fit; this to the uninitiated is bound to be frightening. It is only natural that the novice will copy the methods adopted by his seniors, themselves relics of a bygone day, and come to believe that force is of prime necessity in handling such patients. Thus the miserable picture continues of quiet patients standing idly about while noisy ones are man-handled. I would suggest that it is imperative that new entrants to mental nursing should at first be kept strictly apart from nurses who learned to handle patients by the methods of former days. Some such scheme as the following would achieve this.

For the first six months of his training the nurse would not enter a ward at all, his time being spent exclusively in the occupational therapy room and lecture theatre. Mornings would be devoted to lecture-demonstrations on the various kinds of patients; examples of each type from the stuporose to the maniacal would be shown and detailed information given as to the best way of managing them. Anatomy and physiology lectures with demonstrations of the cadaver could be given and these subjects dealt with far more adequately than by the once-a-week lectures now current. One can only feel sympathy for nurses who at present have to learn anatomy without ever seeing a dissected subject. Even more important still would be lectures on occupational therapy which the nurses would then regard as a normal method of therapy instead of as a waste of time and materials, a view only too common at the present time. Afternoons would be devoted entirely to practical occupational therapy. Here the nurse would become reasonably proficient in the various therapeutical crafts and have it drummed into him that the one sin which cannot be condoned is to see an employable patient sitting idle in the ward. After six months of such training the nurse would proceed for a similar period to the infirmary ward and thence by easy stages to the refractory ward. Only too frequently does one see young nurses introduced to their training via the refractory ward with obviously evil results.

It may not be feasible for individual hospitals to provide such training as outlined above, but it would surely be possible to establish half a dozen centres throughout the country towards the cost of which all mental authorities could contribute. The mental service is today top-heavy in all its departments in that its standards are set by men and women who learned their job in the bad old days when restriction and force were the order of the day. Such a scheme as I have outlined would do much to redress the balance and infuse new life and new standards into the service. Nurses would then go to the wards imbued with the latest knowledge as to how patients should be managed, instead of falling into the unfortunate ways of the oldest member of the ward staff, the chief charge nurse.

I am, Sir, yours faithfully,

A. M. SPENCER.

Banstead Hospital, Sutton, Surrey, March 27.

ABRIDGED LIFE TABLES

SIR,—Medical officers who wish to construct abridged life tables should not be encouraged to accept too readily the contention of Drs. Hill and Hyder, in your issue of Jan. 28, that Snow's method (Suppl. to 75th annual report of the Registrar-General, part II) is applicable under modern conditions or the tacit suggestion that it is the best method. Moreover, some dissatisfaction may be expressed with a demonstration which omits to mention either the amount of arithmetical work or the mathematical assumptions involved in the method or to compare the method with other processes which may have equal, if not better, claims to consideration.

Snow's method is based on the assumption that the shape of the curve of q_x (the rate of mortality) does not vary appreciably from year to year or from district to district. It is true that the secular variation of this shape is not substantial and it is not surprising that results close to English Life Table No. 10 were obtained (by applying Snow's constants based on England and Wales to data from England and Wales). This test does not however deal with the conditions of practice—i.e., the construction of a sectional life table relating to an area smaller than England and Wales, such as a county. It is here that Dr. Snow's assumptions may under certain conditions break down. It may not be correct to assume that the relationships between rates of mortality and survival factors based on England and Wales will be closely reproduced in data relating to (say) Durham. A test of Snow's method against a full table based on a county would have been more convincing.

Generally statistical workers will have perhaps less confidence in empirical methods such as Snow's and more confidence in methods which adhere more closely to the special features of the data from which a life table is being constructed—for example, the method of G. King (Suppl. to 75th annual report of the Registrar-General, part I) or the method of Hickox shown in the *Journal of the Institute of Actuaries* (1930, **61**, 86).

I am, Sir, yours faithfully,

B. BENJAMIN.

Dale Wood Road, Orpington, Kent, March 10.

CARDIAZOL CONVULSION THERAPY

SIR,—We have read with great interest Cook and Ogden's article in your issue of Oct. 15, 1938, on the treatment of severe and intractable cases of manic-depressive psychoses by Cardiazol convulsions. We have tried the treatment on several similar cases but the time since treatment is too short to give a definite opinion. The following case, however, is well worth recording.

A banker, aged 62, has been suffering from a very severe form of involutional melancholia for the last four years. He showed signs that his condition was passing to senile dementia: his speech was monotonous and very poor in content, and there was always smacking of the lips. In the four years many forms of treatment, such as with opium, testicular extracts, and Benzedrine sulphate, were

tried with no effect, and he appeared to be a lost case. After reading Cook and Ogden's article, we decided to try cardiazol after the method of Meduna, the patient's heart, blood-pressure, and urine showing no contra-indication. After the first convulsion the patient, who formerly disturbed everybody with his stereotyped delusions, became quiet; after five convulsions he began to clear up; and now, after twelve convulsions, he is absolutely clear, smiles, shaves himself, takes interest in his dress, and has resumed his former activities.

It appears therefore that cardiazol offers a cure for involutional melancholia even in a patient at such an age and after so many years of illness. This therapeutic effect further emphasises the fact that the border between the depressions and involutional melancholia is not distinct.

We are, Sir, yours faithfully,

HANS HOFF,
J. A. SHABY.

Royal Hospital, Baghdad, Feb. 28.

COLOUR OF VENOUS BLOOD IN RHEUMATISM

SIR,—Some years ago when carrying out the ordinary sedimentation-rate test on venous blood by Westergren's method, I noticed that in almost all severe cases of rheumatoid arthritis the blood was a curious pale red colour, very like Chinese lacquer. The colour is seen most easily in bright sunlight or electric light. At first I attributed this colour to the fact that arthritic patients cannot take much exercise, but against this I found that it was also seen in early cases of arthritis and in young athletic people who had suddenly developed rheumatism and who had been taking active exercise up to the time of the blood test. Again, the red colour is present in hunting men who have been seized with lumbago and in early and chronic osteo-arthritis. If the blood is kept in a Westergren's tube for 24 hours it slowly turns to a dark mahogany colour which is normal for healthy venous blood. I should be interested to know if any others have observed this almost constant phenomenon.

I am, Sir, yours faithfully,

VERNON HETHERINGTON.

Weymouth Street, W.1, March 17.

SALE OF PATENT MEDICINES

SIR,—A fortnight ago there was broadcast in the National programme a discussion on "patent" medicine. The impression I had when listening was that one of the trio who engaged in it said that poor people had a perfect right to do what they liked with their money. I find on reading the report in the *Listener* that I was not wrongly impressed. Before pursuing this point let me quote something else the same speaker said: "between the manufacturer and the public there is always the chemist. Practically the whole of this trade passes through the chemist's hands . . . a highly trained man with great knowledge of the goods that he sells, and the strongest sense of the dignity and importance of his job."

Now, first, I dispute the right of a manufacturer to persuade the poor to spend money on medicines which would be better spent on bread; second, as a chemist, I resent the compliment that I have a "great knowledge" of the goods which the secret-medicine manufacturer makes. I have not the slightest knowledge on the subject and I regard it as an impertinence that the "knowledge of the chemist" should be utilised to bolster up a traffic which offends practically the whole of the craft. But there is another point. There are in this country some 15,000 chemists' shops; there are also 135,000 shops whose owners are licensed to sell "patent" medicine by virtue of the payment of a yearly fee of 5*s*., and I am told on the best authority that the fees for the licences of a very large number of these shopkeepers are paid by manufacturers of "patent" medicines. Digressing for a moment, may I add that the fees are sometimes paid, through the shopkeepers, in kind and not in cash; that is to say, five-shillings-worth of goods are given free to the shopkeeper, who instead of paying the five shillings to the supplier, pays five shillings for the licence. Question: Does the generosity of the manufacturer cost him in some cases more than fivepence? If my old friend the late Colonel E. F. Harrison was right it often costs less than that.

How can the statement that "practically the whole of this trade passes through the chemist's hands" be reconciled with the fact that of the 150,000 people who sell "patent" medicines only 15,000 are chemists? It is common knowledge that most of the holders of patent-medicine licences are owners of little shops patronised by the very poor.

I am, Sir, yours faithfully,

F. C. GOODALL.

Whitehall Place, S.W.1, March 24.

INQUIRIES ABOUT HOSPITAL PATIENTS

SIR,—I was interested to read Dr. Lockhart's letter on inquiries about hospital patients by their relatives, for the same difficulty occurs in this locality. As a rule the staff of the local hospital are most courteous in replying to questions, both from relatives and from doctors; but I have had many complaints that relatives, and doctors, on telephoning to inquire, have had appalling delay in establishing contact with the person concerned. When one realises that most calls by relatives are from a call-box, possibly from a distance, where "three minutes" is the extent of the call, and that the ordinary working man cannot afford to repeat his three minutes up to fifteen minutes, at 6*d*. a call, one feels that the first essential in good staff management of a general hospital is a thoroughly efficient porters' and house-telephone service.

I do not want to bring on my head the wrath of our otherwise excellent hospital telephonists, else my time spent waiting with my ear to the receiver would extend to infinity! Therefore I sign myself

Yours faithfully,

"THREE MINUTES PLEASE."

Bath, March 27.

ROYAL SUSSEX COUNTY HOSPITAL, BRIGHTON.—Speaking at a meeting on March 15 Dr. Donald Hall, chairman of the governors of this hospital, protested against the heavy burden laid on hospitals by the rates. Dr. Hall said: "As we extend our services to the public, so in proportion are we penalised by the municipal authorities." He was referring to the new Latilla department for the treatment of the deformed, the crippled, and the injured which has resulted in an increase of £158 per annum in the rates payable by the hospital. Dr. Hall welcomed the statement that had recently been made by the Mayor of Hove that the time had come for closer coöperation between the voluntary hospitals of the twin towns, and he reminded his hearers that another step towards this coöperation was likely to be taken soon. He said he felt sure they would succeed, and that eventually all would come together in one corporate body. Once that was done it would be the aim of the governors to go further and to see the voluntary and public hospitals working hand in hand.

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

SOME of the best debating in the House recently has been on the Criminal Justice Bill. During last week clause 32 (abolition of power to pass a sentence of corporal punishment) was debated before Standing Committee A with Major Lloyd George in the chair. (Major Lloyd George by the way is a possible for the speakership and his conduct of the proceedings on the Criminal Justice Bill has enhanced his reputation.) The clause as drafted was presented for acceptance by the Government and the debate arose on an amendment by a private member continuing the power to inflict corporal punishment but making it necessary to have the sentence confirmed by the Court of Criminal Appeal. Speeches were not framed on lines of party politics and were always sincere and often passionately sincere. Mr. Rhys Davies, leading the Labour Party members on the committee, spoke of his experience on the committee which dealt with juvenile delinquency and signed the minority report in favour of abolishing the birching of boys. He said "I came to the conclusion that it was really an offence against human nature itself that society should impose this punishment upon boys." Mr. Davies recalled that in the agitation for women's suffrage he said that when women came into public life the law would be more merciful. But it was not so. Women members on the standing committee supported flogging. One Conservative member, speaking against flogging, got "lit up" and said that another Conservative wished to impose the penalty of flogging for all men, whether for sexual offences, cruelty to animals, or under the Riding Establishments Bill, and said he knew that another Conservative regarded him as a "sloppy sentimentalist," which was heatedly denied. Lady Davidson said that "many of us are deeply anxious because of the lack of discipline which is apparent in the whole race at the present time." She spoke of standards of conduct going down and of the lack of religious and moral training in the home. Lady Davidson spoke with gravity and evidently with a deep sense of her responsibility and announced her vote against the abolition of flogging and her intention to do everything she could in the House of Commons to defeat it. Mr. George Griffiths, Labour M.P., who has been soldier and Salvation Army officer as well, told of his own flogging by a farmer for stealing crab-apples from a hedge, and of the grudge he carried until manhood "when a turn came in my life and I forgave him."

The report is too long to quote further but it is a human document worth reading and it is called "Official Report, Criminal Justice Bill, Tuesday, 21st March, 1939," and is priced at sixpence.

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On Wednesday the 22nd there was a debate in the chamber of the House on the report of the committee of inquiry into the anti-tuberculosis service in Wales. The report is a long one running to 291 pages and could have been compressed with advantage. The evidence on which it is based is not printed and is only available in neostyled form in the House of Commons library, and this is an injustice to the committee who drew up the report and a difficulty for all who wish to consider it in detail which it well deserves.

The discussion to which the report gave rise was opened by Mr. J. Griffiths, miner M.P. for Llanelly in South Wales, who spoke with force and fervour of the horrors of bad housing and bad conditions which the report reveals. Mr. Griffiths mentioned that in the black-list of the mortality-rate for tuberculosis seven Welsh counties occupy the seven highest places—Carnarvon, Merioneth, Anglesey, Cardigan, Pembroke, Glamorgan and Carmarthen—and that each of the seven is on the three black-lists for tuberculosis, maternal mortality and overcrowding. Miss Megan Lloyd George strongly emphasised the failure of local authorities to carry out their duties and the feature of the report which draws attention to the poverty of rural areas "greater than in some of the industrial areas in South Wales." Poor nutrition and the other conditions which lack of means—poverty—brings with it were emphasised again and again as causes of the large tuberculosis-rate. On the purely medical side the necessary organisation exists to a large extent, but requires working properly, and the provision for the advanced cases of tuberculosis, so as to control infection in the home, should be increased. The only effective way to do that is to have small homes for advanced cases so that the sick people can be there and die there, near to their families and friends. At present the number of tuberculosis cases in Wales who die at home is very high indeed. But most important is the reform of local government. The total population of Wales is (1936) 2,516,880 and the estimated product of a penny rate for the whole of Wales (1936–37) was £44,096. In six counties the product of a penny rate is below £1000. But in some of the small "urban districts" with populations of under 1000 the product of a penny rate is quite insufficient for any useful services—three examples given are £16, £22, and £12. A drastic reorganisation of local government machinery in Wales is essential if the health problems are to be tackled. The B.M.A. "General Medical Service for the Nation" envisages:

(*a*) The creation of a system of complete and all-embracing units for local public-health administration by the removal of such functions from county district councils below a certain size, the county councils and their county district councils serving large sized areas being given all the public-health and medical responsibilities which county borough councils now enjoy.

(*b*) Limitation of these functions to the councils of areas with a population of not less than 75,000 to 100,000 according to the predominantly rural or urban character of the area.

(*c*) The treatment of hospital services and related medical services as regional problems.

The application, the drastic application, of these principles in Wales is shown to be urgent by this report. The same considerations however also apply to parts of England and Scotland. Wales has been investigated in detail but there is still uninvestigated darkness in many parts of England and Scotland.

In the House of Lords on March 27 the Cancer Bill was read the third time and passed.

FROM THE PRESS GALLERY

Safety in Mines

IN the House of Commons on March 21 on the vote for the civil and revenue departments, Mr. DAVID GRENFELL raised the question of safety in mines. It was a great error to think there was incompatibility between safety and efficiency. Safety was mainly a question of good management. Accidents had shown a steady tendency to increase. The Royal Commission on Safety in Mines had recommended the adoption of a far higher standard of ventilation and the establishment of fracture clinics. Occupational diseases such as nystagmus, silicosis, and dermatitis also deserved attention.—Mr. PEAKE, who spoke as a coalowner, said that there was no other industry where the injury-rate was comparable with mining. The industry itself must tackle the problem in a spirit of coöperation. Several members of different parties expressed the hope that action would be taken in the light of the Royal Commission's report to promote greater safety in the mines of the country.

Mr. CROSS, parliamentary secretary to the Board of Trade, said that unhappily the statistics regarding deaths and serious injuries in mines for 1938 showed little or no improvement as compared with 1937. This year so far there had been a reduction both in deaths and serious injuries compared with the corresponding figures last year. The Government accepted the report of the Royal Commission in its general sense and purport. Any legislation in regard to it would be complicated, but in certain matters advance action on the commission's recommendations might be taken under existing powers. Among these were the improvement of the ventilation in safety-lamp mines, the systematic sampling of the air current in such mines, the general use of sheathed explosives to increase safety in shot-firing, and the enforcement of suitable precautions against the inhalation of dangerous dust. First-aid and health work was being accelerated and extended by the Miners' Welfare Fund Bill. Neither regulations nor more inspectors would achieve real results by themselves without genuine and effective coöperation by the industry as a whole.

Maternity Services in Dumfriesshire and Galloway

In the House of Lords on March 22 the Earl of MANSFIELD asked the Government if they were aware of the inadequacy of the hospital maternity services in Dumfriesshire and Galloway, due largely to the persistent refusal of the local authorities to coöperate with the directors of Dumfries and Galloway Royal Infirmary in providing the accommodation and facilities required. This area of Scotland, which had a population of approximately 140,000, was served for hospital purposes by the Dumfries and Galloway Royal Infirmary. Recently the waiting-list of patients had been on an average no less than 140. Prof. S. J. Cameron, the consulting gynæcologist of the infirmary, had given his opinion that the infirmary should refuse to take any further maternity cases until it had better accommodation for their reception. Money towards extension, to include a proper maternity ward, had been collected, but the extension was held up pending response from the 4 local authorities concerned for a scheme embodying their requirements for maternity cases, though such a scheme had been asked for 2 years ago.—The Marquess of ZETLAND, secretary of state for India, said he understood that the local authorities would require about 70 beds, of which 40 would be maternity beds, but the question arose how the extension was to be financed. The cost in capital outlay to the local authority would be something like £60,000, besides the cost of repairs and maintenance. It was not unnatural that the authorities, before deciding to invest this money in this particular institution, should want to know what its financial condition was. There was in fact an annual recurring deficit, and of the total of £77,000, which the infirmary itself proposed to raise for its part of the extension, only some £37,000 had so far been raised. The Secretary of State for Scotland was prepared to place his services at the disposal of both parties if they thought he could help them to reach a satisfactory agreement.—The Earl of MANSFIELD expressed gratitude for this reply. He said that few infirmaries throughout Great Britain did not have a deficit. The Dumfries infirmary had started a new contributory scheme which was bringing in several thousand pounds a year, and its finances were decidedly better than most of those in this country. He had reason to think that the motion had had the desired effect and that the local authorities had been discussing the matter afresh.

Anti-Tuberculosis Service in Wales

In the House of Commons on March 22, on the motion for the second reading of the Consolidated Fund (No 1) Bill, Mr. JAMES GRIFFITHS initiated a debate on the report of the Committee of Inquiry into the Anti-Tuberculosis Service in Wales and Monmouthshire,[1] which revealed a truly terrible state of things and presented a problem which they must seek in every possible way to solve, whatever might be the effort needed, and whatever might be the expense. Wales was shown to be an impoverished nation, and there were revelations of malnutrition, bad housing, poor schools, and inadequate social services. All these, he claimed, were by-products of poverty and of the ignorance, inertia, and fatalism which poverty bred, plus the subordination of the public welfare to narrow selfish interests. The first message of the report to the people of Wales was that tuberculosis was a man-made disease, and that what they had to conquer was not a decreed fate but a social problem capable of solution. The people of Wales who had been stirred by the report were prepared to act, and they expected the Government to act with them. The report revealed what virtually amounted to a breakdown of local government over wide areas in Wales. Wales had not the resources with which to cope with the problem.

Sir HENRY MORRIS-JONES said that the report was founded on undeniable facts and that in the main the committee had established completely that the position in the principality was a serious one in regard to tuberculosis. There was no more preventable disease among the major categories of mortality than tuberculosis, and there was nothing racial about it so far as Wales was concerned. The most serious factor was the incidence of tuberculosis in rural areas. The industrial areas rather surprisingly had come out of the inquiry exceedingly well. Another serious factor revealed was that the number of persons who died from tuberculosis in institutions in Wales was much smaller than the number in England. That would lead to the conclusion that either there was insufficient accommodation, or an unwillingness of people to go to institutions, or a lack of encouragement among the authorities, both local and voluntary, to make use of institutions, or a lack of any compulsion to go to any institution. The mortality from cancer in Wales was greater than that from tuberculosis, and poverty certainly was not the cause of cancer. Poverty was not actually the cause, but might be a predisposing cause of tuberculosis. In his opinion the main predisposing causes in Wales were appalling housing conditions and bad nutrition. School-children, especially in the rural areas, should receive an adequate midday meal every day of their school life. The report revealed a condition of affairs which was preventable and which the expenditure of only a small amount of money would completely transform.

Miss LLOYD GEORGE thought that the criticisms of local authorities in the report were justified. One criticism stated that medical officers of health had year after year reported upon the bad conditions of housing and sanitation until they were tired of doing so, and that the usual fate of their reports was

1. See *Lancet*, March 18, 1939, p. 658.

that a motion that no action be taken was carried—often unanimously.

Mr. ELLIOT, Minister of Health, said that he supported very strongly the view taken by the committee that if all young contacts could be persuaded to attend for examination immediately they became aware that they had been in contact with an infective case many lives could be saved. The committee brought out most clearly the fact that the field of offensive against tuberculosis, and indeed against disease in general, covered very much wider ground than merely remedial or medical measures such as were talked about on purely health subjects. He had asked for the observations of the Welsh Board of Health on the report, as well as those of the local authorities. He hoped that later it would be possible to call a conference, possibly in Wales, which he would attend and at which these problems could be discussed at first-hand. The report had recommended the freer use of milk, especially in the diet of children. With regard to the purity of the milk-supply he could inform the House that the number of attested herds in Wales had risen from 454 comprising 13,000 animals in February, 1938, to 1460 comprising more than 38,000 animals in August, 1938, and since then had almost doubled; well over 2000 additional herds were being tested with a view to qualifying in due course for a certificate of attestation.

Sir FRANCIS FREMANTLE: Does my right hon. friend say that attested milk is really free from tubercle bacilli?

Mr. ELLIOT: Yes, certainly. The attested herds scheme is intended to eradicate bovine tuberculosis, and the conditions of attestation include very stringent rules in order to maintain the herd in a state of freedom from bovine disease. A great advance had been made in the establishment of the state veterinary service. The admitted difficulty in obtaining supplies of milk in some rural schools in Wales must not be blamed all upon economic forces, or on the policy of the Government. In Wales, as in England, the rate of maternal mortality was coming down. The standard of midwifery was improving and more infant-welfare centres had been established. Against the black background they must bear in mind that progress had been made. As to housing, a grant quite out of proportion to any which had ever been made before was now available for rural housing. Nobody could complain that a grant of 80 per cent. is insufficient to enable the local authorities to go ahead and tackle this problem, which was certainly very urgent. Overcrowding was a very serious matter in some of the counties. In the nine counties the number of overcrowded houses was 5700 in 1935 and 4400 at the end of 1937. There was obviously a large programme to be got on with, but the work in front of the local authorities was not impossible, nor was it unlikely to be achieved.

Dr. SUMMERSKILL said that the report had shown gross neglect by certain small authorities, but was also a glaring indictment of the Ministry of Health and of the Board of Education. What had impressed her most during the debate was the extreme complacency of the Minister himself in the face of this alarming report. Was the House to be content with another conference and letters from the Government to the local authorities? Such matters as the disinfection of houses which had been inhabited by tuberculous people, the sharing of beds by healthy people and phthisical patients, the increase of heart disease through rheumatism contracted in damp schools with no drying facilities, and the death of children from tuberculosis due to infected milk required immediate action. Something must be done at once about cleaning the milk-supply of the country. There were not sufficient beds for the treatment of tuberculosis in Wales, and a medical officer could thus not press patients to go into institutions; moreover when patients went into a sanatorium the public-assistance grant was decreased. The best approach to this disease was to facilitate early diagnosis. One of the finest methods of reducing the morbidity and mortality-rate in Wales from tuberculosis would be to include the dependants of the insured worker under the National Health Insurance Act.

Mr. LINDSAY, parliamentary secretary to the Board of Education, said that in 1937–38 14,500 children in elementary schools in Wales received free solid meals and 68,500 free milk whereas in 1927–28 only 2800 children had been given either of these advantages. Now 27 out of 30 Welsh education authorities exercised their powers in this respect. In 1927–28 the expenditure of Welsh local authorities on these services was £7000; in 1939–40 it was estimated that it would be £120,000. In some places both pasteurised and T.T. milk were unobtainable. Moreover the question of price was sometimes a real difficulty. All the difficulties mentioned in the report about schools in Wales could be solved by proper reorganisation.

Nutrition and Public Health

In the House of Commons on March 23, on the motion for the third reading of the Consolidated Fund (No. 1) Bill, Mr. LEES-SMITH raised the question of nutrition. The Labour party wished to criticise the attitude which a number of departments of the Government were taking towards nutrition. Medical men insisted that by far the most important element in the health and well-being of the people was the actual intake of food in the right quantities and the right proportions. Broadly the medical view was that half the people were sent into this world with jerry-built bodies, and that no amount of tinkering and dosing would give them a sound structure in which to pass the rest of their lives. The chief medical officer of the Board of Education published a short time ago his annual report on the health of the school-child and he gave particulars for 1937 of the routine medical examination among elementary school-children with regard to nutrition. By this method it was found that the nutrition of 15 per cent. of the children was excellent, that of 74 per cent. was normal, that of 10 per cent. slightly abnormal, and that of 0·7 per cent. was bad. Some medical experts on nutrition regarded these results as fantastically wrong. An alternative method of ascertaining the standard of nutrition was to estimate the quantity of proteins, vitamins, carbohydrates, minerals, and so on, required by a child at different ages and to calculate the cost per week of food containing these ingredients. If the family was not able to spend that particular sum of money on food week after week, the children would suffer from malnutrition. The B.M.A. said that a proper standard of nutrition required an expenditure of nearly six shillings per week per child, that nearly 30 per cent. of the population spent less, and that therefore nearly 30 per cent. of the children in the country suffered to a greater or less degree from malnutrition. Sir John Orr had concluded that unless four shillings a head was spent on food the children would be deficient in every constituent of proper nutrition. These discrepancies were most disturbing. Mr. Lees-Smith's view that the Board of Education's figures related to the children who were abnormally undernourished, because they took the undernourished children as the normal in the schools, had medical support.

The remedies he proposed were: the giving of milk in schools throughout the year and to younger children as well as those of school age; the provision of cheap milk in areas other than the special areas where required; services in factories; the revision of unemployment scales; and the provision by the Board of Education of milk and meals for all children who came below the B.M.A.'s scales. These schemes were not impossibly expensive and would be immensely effective.

Viscountess ASTOR said that safer milk was essential if people were to drink more milk. They had to make up their minds to have pasteurised milk.—Mrs. TATE said that no-one knew how many vital qualities of milk were destroyed by pasteurisation.

They wanted milk free from germs produced by herds which were free from disease. She urged that a larger number of children should be medically examined at an earlier age; that the knowledge gained should be centralised and used for the good of the whole community.—Dr. HADEN GUEST said that the total cost of illness in this country, medical and surgical costs, was something like £300,000,000 of which at least one half was to be attributed to some form or other of malnutrition. It was well worth while trying to avoid this extraordinary wastage of life force. In Germany, he understood from Sir John Orr, considerable attention was being given from a realistic and perhaps even from a militaristic point of view to the nutrition of the lowest 10 per cent. of the population. The idea that they could set up an absolute clinical standard of nutrition was an illusion. There must be a reasonable common-sense standard. They needed an optimal condition of nutrition, and not a minimal one. The B.M.A. standard had often been misunderstood. It arose because the Ministry of Health produced a standard of what they thought was necessary to spend on food to give a minimal standard of nutrition. It was a very low standard, and not one which the B.M.A. regarded as desirable.

Mr. ELLIOT claimed that the Government were dealing with the problem of nutrition both by investigation and action, which was producing a marked improvement in the health of the nation. In the lower income classes malnutrition did arise from inability to buy adequate supplies of protective foods, but that was not the only factor. Today 12,000,000 persons were employed in this country at a higher level of wages than they had had at any time since the war. The cost of living had fallen three points in the past year and retail prices of food by five points. There were many indications that the standard of nutrition of our people had improved. A nutrition campaign was already in progress and he believed that they could very greatly improve the conditions under which the country was living today.

Sir FRANCIS FREMANTLE said that in this matter they could not get a single standard which would be applicable generally. Nutrition was not merely a question of the food consumed, but of the whole circumstances of the child's life. Undoubtedly the greatest of those circumstances was poverty. One of the factors in the lack of nutrition was restlessness and lack of sleep. The essence of good nutrition was good cookery, and our people had not got the taste for good cookery. This debate would help them to realise the importance of helping the process of improvement which was now going on so steadily and so hopefully in this country.

QUESTION TIME

WEDNESDAY, MARCH 22

Supply of Milk to Welsh School-children

Mr. JAMES GRIFFITHS asked the Parliamentary Secretary to the Board of Education the number of school-children in South Wales who received milk at school; and the percentage of the total number who were in receipt of a free supply of milk.—Mr. KENNETH LINDSAY replied: On Oct. 1, 1938, the latest date for which figures are available, 144,126 children in public elementary schools in South Wales (including the counties of Brecon, Cardigan, Carmarthen, Glamorgan, Monmouth, Pembroke and Radnor and the autonomous urban areas within those counties) were receiving milk at school. During the month of January, 1939, 53,739 children attending public elementary schools in those areas received free milk. This figure is 37·3 per cent. of the total number receiving milk on Oct. 1, 1938, and 19·3 per cent. of the total number of children on the registers of the schools on that date.

THURSDAY, MARCH 23

Blankets for Emergency Hospital Use

Mr. KENNEDY asked the Minister of Health how many blankets had been ordered for air-raid precautions and emergency hospital requirements.—Mr. ELLIOT replied: The number of blankets ordered for these services is 425,000.

Verminous Beds in Ships

Mr. BEN SMITH asked the Minister of Health whether he was aware that 1069 dirty and verminous beds were found in crews' quarters in Newport in 1937, of which 1068 were in British vessels and that 1637 dirty and verminous beds from crews' quarters were destroyed in Swansea in the same year; and whether he would give the corresponding figures for the other ports.—Mr. ELLIOT replied: I am aware of the facts stated. I will have the available information on this subject examined and will communicate with the hon. member.

Water-supply and Sewerage and Civil Defence

Mr. SORENSEN asked the Minister of Health whether, in view of the need for securing an adequate supply of pure and wholesome water and a satisfactory sewerage and sewage-disposal system in every village to be utilised in a national emergency to accommodate women and children evacuated from danger zones, he was prepared to give further consideration to making further contributions towards the expenses incurred by a local authority in providing a supply, or improving an existing supply, of water in a rural locality, and also making contributions to a local authority towards the expenses of providing or improving a sewerage and sewage-disposal system in a rural locality.—Mr. ELLIOT replied: In the evacuation arrangements steps will be taken to avoid areas where insuperable difficulties are likely to arise on account of water-supply or drainage. It is not considered that the number of such areas will be large, and I am not satisfied that there is any case for grants from national funds for the purpose of improving water-supply or drainage in rural areas as part of the evacuation scheme.

MONDAY, MARCH 27

Army Recruits and Dental Treatment

Mr. WHITELEY asked the Secretary of State for War whether he was aware that when recruits were found to have unsound teeth recruiting sergeants were recommending them to join approved societies who supplied dentures as an additional benefit; and whether he was prepared to stop this unfair form of canvassing.—Mr. HORE-BELISHA replied: The suggestion made is difficult to reconcile with the fact that dentures are now supplied at the public expense to recruits who need them; but, if specific instances can be given, investigations will be made.

TUESDAY, MARCH 28

Public Assistance and Health-insurance Benefits

Sir SMEDLEY CROOKE asked the Minister of Health if his attention had been called to the practice of many public-assistance committees who, although disregarding the statutory amounts of national health-insurance benefit and/or disability pension while the applicant was at home, took such amount into consideration as family income, and deducted from sick allowance when a patient was sent to a convalescent home or hospital, thus depriving him of personal benefit; and whether, as in many instances there was a consequential disproportionate reduction in the family income resulting in hardship, he would take steps to instruct these committees to cease such practice.—Mr. BERNAYS, parliamentary secretary to the Ministry of Health, replied: My hon. friend's question involves legal questions on which my right hon. friend has no power to give instructions to local authorities. I am not aware that the practice of local authorities is giving rise to hardship, but if my hon. friend has any particular case in mind I shall be glad to make inquiries into it and communicate with him in due course.

WESTMINSTER HOSPITAL, LONDON.—Mr. Bernard Docker, chairman of this hospital, has given £25,000 to its rebuilding fund. This gift brings the fund up to £60,000. An appeal was made on March 8 for £100,000, so that the new building might be opened free of debt on April 20.

PUBLIC HEALTH

First-aid Posts and Ambulances (A.R.P.)

IN view of the decision that one or more doctors should be in attendance at first-aid posts, fixed and mobile (A.R.P.), the schedules of the stores and equipment suggested for these posts have been revised. The new schedules are set out in circular 1789 (H.M. Stationery Office, 3*d.*) issued by the Ministry of Health to the authorities concerned. The Ministry is purchasing the main items in the schedules and will distribute them. Wherever possible the drugs and dressings are to be stored at hospitals, turned over with the normal hospital supplies and distributed when an emergency seems to be developing; non-perishable equipment will be stored wherever convenient and must be maintained in sound condition. Mobile units, which are likely to be largely used in suburban areas, are to consist of such motor vehicles as Bedford trucks or Ford vans, carrying equipment and the medical staff but not the women auxiliaries to be attached to the unit, who will generally have to travel separately. It is hoped to arrange for the allocation of one trained nurse to each post. It is not proposed that first-aid should be carried out inside the vehicles but under the shelter of any convenient building, or even, if the weather is fine, in the open air. Specifications for the furnishing of the units, for which the Ministry will bear the cost, are set out with diagrams and measurements of detachable cupboards and splint boxes which can be made locally. An annual fee (the amount to be settled after consultation with the B.M.A.) may be paid in peace-time to the doctors allocated to first-aid posts, for supervising the collective training of the auxiliary personnel. In fixed posts the personnel recommended is 60 or 40 per post, according to the area, with a 25 per cent. reserve, the calculation being made on a basis of 6 posts per 100,000 population. In mobile units 18 women auxiliaries are proposed, besides the doctor and nurse. The numbers assume working in three 8-hour shifts. It is suggested that only 20 per cent. of the total personnel need be recruited for whole-time service even in congested areas, and possibly none in posts located in existing medical premises. The rest would presumably be on call and would go to their posts when warning is given.

Circular 1787 (H.M. Stationery Office, 2*d.*) describes the functions of an ambulance officer and deals with such matters as the earmarking of vehicles to be adapted in an emergency, the training of voluntary drivers (mostly women, but the incorporation of a substantial number of men between the ages of 30 and 50 is advised) and the plans for operating the service during air-raids.

Part-time Medical Work for the L.C.C.

In 1936 the L.C.C. approved the employment of part-time assistant medical officers on a sessional basis to assist in the antenatal clinics at three general hospitals. The arrangement was for a year in the first instance and was subsequently extended to March 31, 1939. The hospitals and medical services committee is now recommending the organisation of this service on a permanent basis at five hospitals with remuneration on an annual basis of £90 a year for one session of approximately 2½ hours a week for 52 weeks a year and at the rate of £65 a year for each additional session. The annual leave is not to exceed 6 weeks, and the person appointed will nominate and pay an approved deputy during absence from duty while away on leave or through sickness; if he desires the council to provide a deputy his own pay while away during the period of absence. He will pay his own travelling expenses and will work on the basis of a month's notice on either side. The terms of service do not sound particularly attractive, but practitioners will presumably be able to learn more about the fate of the women they examine than they are able to do at an antenatal centre not attached to a hospital, and those interested in midwifery may welcome the opportunity of improving their technique in this way. Other part-time appointments reviewed by the committee are those of district medical officers and assistant district medical officers, the proposals in regard to salaries and allowances being based on the amount of work carried out during the past year. Of the assistant district medical officers whose salaries are changed 13 get a rise varying from £10 to £55, and 3 are subject to a reduction of from £20 to £25. Of the district medical officers 4 will have the provisional allowance, granted in addition to the normal salary, reduced, and 2 will have it increased, the differences varying from £10 to £30. The revised scale of salaries and allowances will remain in force until June 30, 1940, or until any further reorganisation of medical relief districts may necessitate their revision. The work done by these district officers, of which there are about 100, is increasing. The number of persons seen by them during 1938 was some 50,000 against 48,100 in 1937; the corresponding figures for attendances at surgeries and medical relief stations were 184,200 against 181,300, and for domiciliary visits 63,800 against 63,000.

Typhoid at Nottingham

A small outbreak of enteric fever came to light in the Wells Road district of Nottingham on Feb. 24 and was briefly described in THE LANCET of March 11. Dr. Cyril Banks, the medical officer of health, last week issued a statement saying that the infection has been traced to food which had a very limited distribution. "Its source was quickly traced and the cause of the contamination removed. The medical officers are satisfied that the great majority of the patients had consumed the food before the middle of February, and that the outbreak, as such, is at an end, the source having been removed. There may still be a few cases arising in certain households at present under observation."

Billeting of Refugees in Villages

The unwisdom of making billeting arrangements without consulting the medical officer of health of the reception area was emphasised by Dr. Ashleigh Glegg (M.O.H. for East Sussex) and Dr. Dunstan Brewer (M.O.H. for Swindon) at the annual meeting of the National Baby Week Council reported in the *Morning Advertiser* of March 23. Dr. Glegg referred to the knowledge of housing, water-supplies, sewage-disposal and tuberculous infection possessed exclusively by the public-health staffs, and urged that the returns now being made by rural authorities should be regarded as giving only gross figures. These returns should be scrutinised by the officers responsible for health and for maternity and child welfare, and the scrutiny should not be delayed until the next crisis, for it might demonstrate a need for more accommodation of children in camps.

He also pleaded for an early conference between the medical officers of the reception areas on the one hand and of the evacuation areas on the other. Dr. Brewer, endorsing Dr. Glegg's appeal for consultation with the medical officers, said that the Government had arranged for amateurs to make a house-to-house investigation to find out what the public-health departments knew already.

PANEL AND CONTRACT PRACTICE

Not Temporary Residents

A medical-service subcommittee has been dealing with a case in which a practitioner accepted a considerable number of persons as temporary residents, and received the appropriate remuneration but did not fully understand what the term meant. It had been noticed in the committee's office that this practitioner was accepting more temporary residents than his neighbours, and it was also observed that of 54 thus treated he later accepted no fewer than 35 on his permanent list. Inquiries showed that 14 out of 16 more recently accepted "temporary residents" could not properly be regarded as such.

The terms of service contain no definition of what constitutes a temporary resident, and reference must be made to regulation 17, which says that the removal of an insured person shall be considered temporary if when he removes he intends to remain less than three months. In the area of the committee concerned in this case the ratio for payment is 6 to 1; that is, if a practitioner accepts an insured person as a temporary resident and submits a continuation card showing that he has in fact provided treatment, he receives the equivalent of eighteen months' remuneration—say 13*s.* 6*d.* This provision is made, of course, because these patients are not treated on an insurance basis; broadly speaking, it is only those who require immediate treatment that seek the help of a temporary doctor. It is clear therefore that for an insured person to be accepted as a temporary resident he or she must definitely intend or expect not to remain more than three months in the neighbourhood, and in fact he has to sign a declaration to that effect.

The respondent practitioner told the subcommittee that his district has a notoriously floating population; but he admitted that he had entirely misconstrued the definition of a temporary resident. He was under the impression for instance that a domestic servant who was not sure whether she would remain in her situation could be regarded as a temporary resident for the first three months. The subcommittee found some difficulty in appreciating this point of view, for it is well known that domestic servants are apt to change their situations and those who framed the regulations were not likely to have arranged that such persons should attract the equivalent of eighteen months' remuneration to a practitioner merely because it is uncertain whether they and their employers will get on well together for as long as three months.

The doctor's frank admission made it unnecessary for the subcommittee to prove the facts. He asked that the amount irregularly obtained from the Practitioners' Fund should be repaid in full and he accepted as a basis of his offer that he should repay the difference between the amount paid him in respect of temporary residents over the past three years and that which he would have received if his proportion of temporary residents had been the average for all practitioners in the county. This amount was computed at £79 6*s.* 3*d.*; but the committee wished to give full credit to the arguments adduced by the doctor as to the peculiarities of the insured population in his district, and they therefore decided that the sum to be repaid should be assessed at £70. It is to be recovered in three instalments.

The Practitioners' Fund

The Central Practitioners' Fund for 1938 has been finally determined at £7,514,903 compared with £7,200,125 for 1937. Insurance committees are now proceeding to distribute the balance available to practitioners, and the result in London is to make the value of a unit of credit for 1938 approximately 9*s.* 3·6*d.* The balance for distribution in London is £44,573 as compared with £68,958 for 1937.

The Central Practitioners' Fund for 1939 has been provisionally determined at £7,252,000, and in notifying insurance committees of this the Minister has uttered his usual warning that the final determination of the fund will not necessarily enable any additional payment to be made to practitioners at a later date.

Costly Medicines

Critics of national health insurance have from time to time alleged that insurance practitioners are debarred by their conditions of service from prescribing for their insured patients any medicines, however effective, if they are costly. Panel doctors, such critics contend, have to do the best they can with cheap medicines. A case reported to the Derbyshire insurance committee at their meeting on Feb. 21 shows that this allegation rests on a misapprehension. In this case the patient, who was suffering from paralysis, had prescribed for him by his insurance doctor a drug (Prostigmin) which during 1938 cost no less than £308. The total sum spent by the committee in supplying the patient with medicine from the beginning of his illness was £470. No member of the committee raised any objection to the expenditure, which was regarded as necessary to keep the patient alive.

An insured person is entitled under the National Health Insurance Act to such "proper and sufficient medicines" as his insurance doctor prescribes for him, and a doctor is not debarred from prescribing any medicine, however costly, if he can show, should the question be raised, that it was necessary for the proper treatment of the patient.

ST. MARK'S HOSPITAL, LONDON.—The number of patients treated at this hospital during 1938 was the highest recorded; 1027 were admitted as against 997 in 1937 and 662 in 1924. The number of patient awaiting admission exceeds 250 and is rapidly increasing. The space set free by the erection of the nurses' home is to be used to improve the operating-theatre unit and increase the accommodation in public and private wards. Work on the second operating-theatre will be completed this year. About £33,000 is still required to cover the cost of the nurses' home and the reconstruction work and extensions. Steps are being taken to enlarge the accommodation of the X-ray department and to install modern equipment. The follow-up scheme for cancer cases now provides a systematic record of all cases admitted to the hospital from 1910 onwards. Tumour cases have been grouped into three classes: group A, or early operable; group B, in which the muscle wall of the bowel has been penetrated by the growth; and group C, or late operable, in which extension outside the rectum has occurred, with invasion of the regional lymph-nodes by the growth. Results indicate that about a fifth of the cases fall into group A, a third into group B, and a half into group C.

OBITUARY

JOHN SAMUEL RISIEN RUSSELL

M.D. EDIN., F.R.C.P.

THERE are probably not very many now who, reading of the passing of Dr. J. S. Risien Russell at the age of 75, will recall the great part he played in establishing the position of the British school of neurology in the last decade of the nineteenth century, and in forming that tradition of combined experimental research and clinico-pathological study that has been at once the mark and the strength of neurology in this country.

Risien Russell was a graduate of Edinburgh University, where his M.D. thesis obtained the gold medal. After qualifying in 1886 he spent a few months in post-graduate work at St. Thomas's Hospital and then went to the National Hospital, Queen Square, where he was successively resident medical officer, registrar, and pathologist. He completed his training in Paris and Berlin, returning to Sir Victor Horsley's laboratory at University College to embark upon a course of brilliant experimental work before his appointment to the staffs of the National Hospital and University College Hospital. As his success in clinical neurological practice grew he developed another interest. His medicolegal skill became so well known that his services were constantly sought as expert witness in important litigation on such questions as the sanity of a patient. In more than one famous case his opinion conflicted with that of experienced psychiatrists, and this led to unhappy differences and controversies. It is not however on his forensic exploits that his fame will rest but on his contribution to neurological medicine.

"It was in the golden age of British neurology," writes Dr. F. M. R. Walshe, "that Risien Russell took up this work. At that time Ferrier and Turner, Horsley, Beevor and Mott and others were in the full tide of their physiological researches, while on the clinical side Hughlings Jackson, Gowers, and Bastian were working with no less distinction and success at Queen Square. In this stimulating atmosphere Risien Russell's gifts soon began to bear fruit and in the *Philosophical Transactions* and the *Proceedings* of the Royal Society and in the pages of *Brain* there appeared from 1890 to 1900 a succession of papers from his hand, all of primary importance. These papers include experimental studies on the functions of the cerebellum, upon the afferent and efferent pathways of this organ and the results of their stimulation and destruction, upon the constitution of the brachial and lumbosacral plexuses, and upon the effects of various lesions of the central nervous system upon the knee-jerk. In the clinico-pathological field he was not less active. One of his first papers, written with Dr. James Taylor, recorded a critical study of the value of the suspension treatment of tabes dorsalis for which so much had been claimed. In 1900, with Batten and Collier, he published the classical paper on the malady they named subacute combined degeneration of the spinal cord, a clinical account to which, after the lapse of forty years, little that is material can be added.

"By the end of this fruitful decade Russell's amazing gift for clinical teaching had laid the foundations of the extensive practice that ultimately withdrew him from original work, but he had made his mark on neurology. There is still a freshness in the papers embodying his experimental work that makes them well worth reading for their content, and studying for their lucidity and orderly arrangement. His name is not now often found in bibliographies of work on the cerebellum, yet no-one engaged in this field can afford to neglect his papers. They showed a clear appreciation of the fact that cerebellar ataxy is essentially a feature of voluntary as opposed to reflex movements, and is thus a product of cerebral motor activity—a notion that is only now coming into its own. He pointed out also that the first effect of a progressively increasing asphyxia upon the spinal cord is to exalt its reflex activity—as exemplified in the knee-jerk—and then in more severe degrees to diminish and abolish this activity. In a word, he could well stand comparison with the giants amongst whom he worked.

"His gifts as a clinician are at once a happy recollection and an inspiration to all who may have seen them in action. He had an incomparable command of language and was able to present a vivid picture to the crowds who flocked to his demonstrations. Nor was there anything flashy about his exposition, for as he developed it he clearly laid before his hearers the train of his reasoning. Of his kindness and fine consideration for his juniors an old house-physician may not forbear to speak. Whatever one's shortcomings one was never humiliated by him, and his thoughtfulness and patience were never exhausted."

Dr. James Taylor writes: "Thirty years ago Risien Russell was the best known of the younger neurologists. His advice was fortified by wide clinical knowledge and sound common sense, and invested with sympathetic understanding, and he came to be almost the highest court of appeal in obscure and difficult cases. In the law-courts he was a clear and admirable witness. Perhaps his greatest gift was that of clinical teaching. At the National Hospital where he became R.M.O. in 1888 he was brought into intimate contact with Hughlings Jackson, Gowers, and Horsley, and later he was a worthy successor to Gowers as a teacher of post-graduates in the outpatient department. He was very adaptable and when appointed to University College Hospital he quickly established his reputation as a really great clinical teacher of undergraduate students. Risien Russell changed so little as the years passed that it was difficult to believe that he carried a load of more than 70 years. His mind, and his manner too, were as they had always been, almost youthful. The cordiality of his friendship never varied, and those who valued him most were those who had known him longest."

ROBERT McMILLAN BOWMAN

M.B. EDIN., D.P.H.

Dr. Robert Bowman, who died recently at Bangor, co. Down, was a son of James Bowman of Bangor and was educated at Bangor grammar school and Edinburgh University, where he qualified in 1917. He entered the navy and served with the Dover

Patrol, taking part in the action at Zeebrugge on St. George's day, 1918. After the war he worked for a time in London and on returning to Ireland held a post in Belfast under the Board of Pensions. In 1926 he entered general practice in Bangor.

Following the example of his father, Bowman interested himself in local administration, and in 1931 was returned at the head of the poll as alderman of the Castle ward. In 1937 he was elected mayor of Bangor borough, and he was mayor at the time of his death. He leaves a widow and two sons, of whom one qualified at Belfast last year and the other is a student at the Royal College of Surgeons in Ireland.

WILLIAM ISAAC CUMBERLIDGE

M.B. CAMB., F.R.C.S.

IT may be said of Mr. Cumberlidge that he set himself a definite course and pursued it all his life, for his ambition always was to become a surgeon and he died as senior surgeon to Leicester Royal Infirmary a year before he was due to retire. He was born at Eaton in Cheshire in 1880, the son of H. J. Cumberlidge of Hyde, and from Macclesfield grammar school went with a natural-science scholarship to Christ's College, Cambridge. He took honours in both parts of the natural-sciences tripos and then in 1902 went on to St. Bartholomew's, where he qualified in 1904. After house appointments at Bart's and elsewhere he took his F.R.C.S. in 1907 and went as house-surgeon to Leicester Royal Infirmary in 1908. There his keenness in his work and his natural ability led to his election to the honorary staff in 1911. During the war he served as captain in the R.A.M.C., being first attached to the Fifth Northern Base Hospital in Leicester and later to a hospital at St. Omer.

Perhaps the secret of Cumberlidge's success was that he was always dependable. He possessed, too, a gravity of speech and deportment even in his young days which made him seem older than his years and added weight to his opinions.

He never married, but lived with his mother and two sisters. He was a keen student of nature and spent much of his leisure walking. He was a freemason and at the time of his death was G.S.W. of the province of Leicestershire and Rutland. We shall remember him, says a colleague of many years' standing, as one who never shirked a duty, and as a hospitable and loyal friend who never said an unkind word of anyone.

IAN MOUNT GRANT

M.D. EDIN., J.P.

Dr. Ian Grant, medical superintendent of Glasgow Royal Infirmary, died on March 19 at his home in Glasgow, after a long illness, at the age of 55.

He received his early education at Edinburgh Academy and his medical training at Edinburgh University, where he graduated M.B. in 1907 and M.D. in 1910. He also studied in Dublin and Paris. After holding house appointments in Edinburgh and Lincoln he started in practice at Rugby in 1911. At the outbreak of war he volunteered for service and served with distinction in Flanders and France with a field ambulance, at a hospital, and with a Guards battalion. He was wounded in the knee at the second battle of the Somme, and was finally invalided out of the service with the rank of major. Later he was appointed neurologist under the Ministry of Pensions for the Glasgow area, and part-time medical superintendent of the Glasgow Eye Infirmary. Here his capabilities and tact as an administrator were soon recognised, so that when the post of medical superintendent of the Glasgow Royal Infirmary became vacant in 1925 he was selected for this office. He was always keenly interested in hospital construction and in the development of hospital services, and during his period of office he supervised the planning and construction of the Canniesburn auxiliary hospital for convalescing patients and the annexe for paying patients of the Royal Infirmary. Later, when the need for extending the present infirmary became urgent and the adjacent premises of the Royal Asylum for the Blind became vacant, he did a great deal of extra and often harassing work in connexion with reconstructing this building as a hospital. In the midst of this, about nine months ago, he was stricken with the illness of which, in spite of an operation, he ultimately died.

Although never a quick worker, Grant was at all times thorough and painstaking, never sparing himself in the service and interests of the infirmary, to which he devoted the whole of his energies. He was a delightful host and had a large circle of friends, but he had little spare time for the ordinary round of social life. He is survived by his wife, who has for many years taken a leading part in the promotion and organisation of entertainments in aid of Glasgow charities.

ROY SAMUEL DOBBIN

O.B.E., M.D. DUBL., F.R.C.P., F.R.C.O.G.

Prof. Dobbin, whose death on March 21 was announced in our last issue, occupied the chair of midwifery and gynæcology at the Royal School of Medicine, Cairo, and was obstetric surgeon and gynæcologist to the Kasr-el-Aini Hospital. He was educated at Trinity College, Dublin, where he qualified in 1899, and afterwards studied in Berne, Vienna and Berlin. He held various house appointments in Dublin, demonstrated anatomy at Trinity College, and for a time was bacteriologist at Steeven's Hospital. He then became assistant master and extern assistant at the Rotunda and from there was appointed to his professorship in Cairo. During the war he served as a surgical specialist with the British Expeditionary Force in France.

"If Dobbin ever desired a monument," writes A. K. H. "he has it in the great department of gynæcology and obstetrics at Kasr-el-Aini. It was his creation, cherished and served for more than thirty years, and he has left it in the hands of old pupils who had long since become distinguished and honoured colleagues. His presence in the faculty of medicine was very potent indeed—a self-effacing power working like a beneficent enzyme. The deep imprint of his personality, even after slight social contact, was extraordinary in one who studied and achieved quiet. *Il apporte la paix* was said of him by people of perception. But he brought much more than that, for he loved to foster and watch gaiety. He continued in a sense with his own the charming fun of his elder friend, whom he called 'the Professor,' the geo-physicist Joly, who delighted in Dobbin's almost complete innocence of mathematics. His letters—and even their envelopes—to children, to his friends, written in the bold script, beautiful in Arabic or English, which he had caught from well-loved manuscripts, were a joy and privilege. A blot would be elaborated to strut with a sword and feathered cap, and that would start a spate of delicate phantasy and illuminate the margins of page after page.

"He had in youth been the friend of artists great then and since. In a walk through familiar streets he could give companions a glimpse through magic casements that seemed to be his common outlook,

and he drew children to him by something childlike in himself whose own knowledge of men and things was wrinkled deep in time.

"He could read a musical score and go home and play it from memory, a gift which left him once during months of illness and caused delight when it returned. One knew him in facets, by glimpses. I recall the surprise of his oldest friends when his priceless books, collected for years, first came to Cairo—his seven copies of Vesalius, his exquisite book of hours with the Tudor binding from Catherine the Great's library—and one learnt in the rare disorder of a great room ('*la cité des livres*') to turn heavy pages by the upper corner.

"Happiness he gave to others continually and dignity to ordinary life; and with him prestige—that impalpable thing—was never in hands more utterly safe."

Prof. Dobbin was elected a fellow of the Royal College of Physicians in 1932, under the by-law covering the election of non-members. He has died at 67 years of age, and was unmarried.

ELKIN PERCY CUMBERBATCH

M.B. OXFD, F.R.C.P.

Dr. Cumberbatch, medical officer in charge of the electrical department at St. Bartholomew's Hospital, who died on March 24 at the age of 58, will rank with d'Arsonval of Paris as a founder of modern diathermy, and did more perhaps than anyone to place electrotherapy on a rational basis.

He was the son of Charles Cumberbatch of Queen Charlton, Somerset, and was born there in 1880.

[*Elliott and Fry*

As a student he was brilliant; he was a senior foundation scholar of St. Paul's School and left with a senior entrance scholarship to Keble College, Oxford, where he obtained an open science scholarship. He took first-class honours in the final school of physiology and went on to St. Bartholomew's Hospital as senior university scholar. After being house-physician at St. Bartholomew's he became demonstrator of physiology in the medical school and chief assistant in the X-ray department. When X-ray work was taken out of the old electrotherapeutic department in 1912 Cumberbatch was put in charge of the electrical department. During the war he was in charge of the medical electricity department at the First London General Hospital, and the enormous amount of work he did there on muscle-nerve testing laid the foundation of his mastery of this branch of electrology.

One of Cumberbatch's greatest contributions was his establishment of a standard of orthodoxy at a time when the physiological effects of electrical currents were misunderstood. He accomplished this by his teaching, examining, and his writing in textbooks and elsewhere. His lectures for the D.M.R.E., his books "The Essentials of Medical Electrology" and "Diathermy," and his contributions to the "Encyclopædia of Medical Practice," the *Archives of Radiology and Electrotherapy*, of which he was joint author, and *The Lancet* and other journals are characterised by simplicity, clearness and painstaking thoroughness. He was an experienced and fair examiner, and his kindly manner never flurried the examinee. His outlook was essentially academic, and his critical mind was slow to accept clinical results not based on accurate observations. When diathermy began to be used in this country for purposes other than surgical coagulation continental teaching attributed its results to some specific action rather than to the heat evolved. Cumberbatch supported the view that the effects were entirely thermal, and this has since proved to be correct. Later he held the same view of the effects of ultra-short-wave diathermy.

At St. Bartholomew's Hospital Cumberbatch with C. A. Robinson developed the technique of treating pelvic and cervical infections by diathermy, and they were led to recognise a new syndrome—namely, the combination of lower backache, depression, toxicity and arthritis in married women especially around the menopause. Cumberbatch also helped to perfect the technique of electrodiagnosis, which he thought the most skilled work the electrotherapist is called on to do.

In 1921 Cumberbatch was president of the section of electrotherapeutics of the Royal Society of Medicine; in the following year he presided over the section of electrology at the Bilingual Congress in London; he was a member of the council of the Röntgen Society and of the British Association of Radiology and Physiotherapy; in 1933 he was the first in his specialty to be elected a F.R.C.P.; and in 1936 he was president of the section of electrotherapeutics at the International Congress of Physical Medicine in London. Many will miss the cheerful welcome he always extended to visitors to his department, and the enthusiastic instruction they received there. His ready encouragement, geniality and unruffled temper endeared him to all, and he was a staunch friend.

In 1918 Dr. Cumberbatch married Isabel Gibbons of Valparaiso, and he leaves a widow and one son and a daughter.

SAMUEL HYBBINETTE

Prof. Hybbinette, who was to have been general secretary of the International Surgical Congress in Stockholm in 1941, died very suddenly on Feb. 12. He was born in 1876 in the county of Stockholm. From 1897 to 1899 he studied anatomy at the Karolinska Institut, and between 1901 and 1907 he held various surgical hospital appointments. Studies abroad, in France in particular, widened his knowledge of languages and surgery, as did his attendance then and later at national and international surgical conferences. In his early years he came under the stimulating influence of John Berg—"Father Berg" to his students. In the autumn of 1908 Hybbinette came to practise surgery in Stockholm, without any academic or hospital appointment to add lustre to his name. He had, however, already attracted attention as a first-class anatomist and as a brilliant operator, and when a vacancy occurred in 1921 by the promotion to Uppsala of the chief of a surgical hospital service in Stockholm, Hybbinette was put in charge of it.

Hybbinette's contributions to surgery reflected his flair for problems in mechanics and his manipulative dexterity. Book-learning he distrusted, and so, though he had a remarkable knowledge of the literature of his own subjects, his work was marked by independent thought and initiative. His main interests were the surgery of the abdomen and bones

and plastic surgery. He and Eden of Germany independently devised the procedure now known as the Eden-Hybbinette operation for recurrent dislocation of the shoulder-joint. As recently as November, 1938, he addressed the Swedish Medical Society on the subject of cleft-palate and hare-lip—conditions for which he had evolved an effective operative technique. At the International Surgical Congress in Warsaw in 1929 he lectured on reconstructive surgery of the hip in cases of arthritis deformans. He was in close and constant touch with surgical colleagues throughout the world, and was a member of the International Surgical Committee. The choice of Stockholm for the coming surgical congress was made as a tribute to Swedish surgery in general and to Samuel Hybbinette in particular.

CLEMENT TREVES NEVE

M.B. LOND., F.R.C.S.

Mr. C. T. Neve, who died on March 2 at his home at Croydon at the age of 51, came of a medical family who are well known as missionary surgeons on the North West Frontier, while his second name recalls his uncle, Sir Frederick Treves. Neve was educated at St. Bartholomew's Hospital where he carried off the Kirkes scholarship and the gold medal in clinical medicine when he qualified in 1911. He held resident appointments at Bart's, at the hospital then known as the East London Hospital for Children at Shadwell, and at the London Temperance Hospital. His interest in surgery was already aroused and in 1913 he took his F.R.C.S. But he belonged to a generation of medical men whose work was to be interrupted, and in 1914 he joined up. For the next five years he served as a captain in the Royal Army Medical Corps. Soon after his return to civil life he settled in Croydon. In 1920 he joined the senior honorary surgical staff of Croydon General Hospital where he gave generously of his time, care, and skill to the patients. He also served on the board of management of the hospital. He was a quiet retiring man, but he inspired admiration by his capabilities, and affection by his kindliness. His leisure was divided between his garden, which he cultivated with informed diligence, and the open countryside which he greatly loved. He leaves a widow, a son, and three daughters.

HARRY BACON WILKINSON

M.R.C.S.

AFTER a long and painful illness Dr. Wilkinson died at Southport on Feb. 22 at the age of 71. He was the son of James Wilkinson, the proprietor of a preparatory school at Southport. He entered Guy's in 1885 and qualified in 1892. He was in poor health at that time and so he served in the mercantile service for a few years, afterwards holding appointments at Guy's, Nottingham Children's Hospital, and Worcester Mental Hospital. He was then appointed deputy medical superintendent of the Plymouth Mental Hospital, a post he held until he retired in 1932, except for a time in the R.A.M.C. during the war, when he was neurologist of the Ministry of Pensions for the Plymouth district and served with the Mediterranean expeditionary force in Serbia, Salonika, Egypt, and Turkey. In medical practice his chief and almost sole interest was in neurology and psychology, and he put the whole of his energy into his work. Perhaps his chief regret towards the end of his life was his inability to attend the meetings of the local medical societies.

Dr. Wilkinson was unmarried.

THE LATE MR. LEONARD JOYCE

Prof. J. A. RYLE writes: "Of good men and women there are plenty, but we count ourselves fortunate if in a lifetime rich with human contacts we encounter ten of truly outstanding nobility of heart and character. Among such precious company there may be one or two who claim our further regard and affection for some rare quality of mind or conduct or for the perfection of their scientific or humane achievement. By all who knew him well, Leonard Joyce of Reading will be included at least within the first of these two categories, by his intimate friends with the elect minority.

"His professional life was one of unceasing endeavour to achieve the best. The writer of these notes is probably not alone in the belief that he actually achieved it, so far as one man can do, in the realm of surgery, and that, in the last decade or so of his active life, neither London or any other city in these islands could boast a better surgeon. In diagnosis, in judgment, in the care and scientific thoroughness of his investigation of cases, in operative skill and technique and in aftercare he made himself a master. Nor did he confine himself to a single branch of his art. The needs of a large county hospital, where fine general surgeons are often bred, do not stop short at abdominal surgery or the ordinary routine procedures and emergencies. Joyce's opinion and action in a thoracic or genito-urinary problem or, if occasion arose, in a neurosurgical problem were instructed, not by necessity, courage and enthusiasm alone, but by educated thought which he constantly sought to keep abreast of modern advances. A neurological friend who visited him a fortnight before his death found him fully conversant with all Cushing's monographs. His reading and knowledge of the literature was very wide. Year after year he would spend a part of his holidays visiting foreign clinics and in his unobtrusive way he was an active member of several of the more important medical societies.

"It was significant of the admiration which his colleagues felt for him that a group of London surgeons a few years ago paid a special visit to Reading to see some of his work and to enjoy demonstrations not only of his surgery and its results, but also of his private pathological collection accumulated in illustration of the subjects which had particularly engaged his interest. He was an originator and the chief inspiration of the *Royal Berkshire Hospital Reports*, a periodical unique of its kind. He was not a prolific writer, but all his publications were of a very high standard and they covered a wide field. Noteworthy papers came from his pen on the surgical aspects of peripheral nerve injuries, on carcinoma of the breast, on an operation for the substitution of a thumb, on renal carbuncle and perinephritis, on subperitoneal effusions simulating intraperitoneal disease, and on his follow-up system. To the very last his mind was active with discoveries and improvements likely to be of value to himself and others, based upon his long experience and collected and classified by means of his careful system of records and follow-up inquiry.

"Whether in the Royal Berkshire Hospital, where he became senior surgeon, or in his nursing-home, Dunedin, the quality of his conscientious work and organisation was always a matter for admiring comment. A consultation with him at Dunedin was a great privilege. Both in the urgent and the chronic case his judgment was so sound and so carefully considered as rarely to call for criticism or modification. Cases requiring special investigation had

always received, in advance of the consultation, every possible advantage of modern radiological or chemical study. His colleagues accounted themselves almost as fortunate in the help which he gave them as their patients who came under his care. He inspired a deep devotion in his hospital associates and in the sisters and nurses who worked for him. It is no wonder that his aid was constantly sought throughout Berkshire and the neighbouring counties and beyond and that for years he was grossly overworked.

"To all his other qualities were added a quiet humility, an intellectual code, and a power of self-criticism unusual in a man of such abundant activity and achievement in a practical field. Kindly and tolerant in his human relationships, with a gentleness to his patients masked only in a slight degree by his seriousness, genuine in his affection for his fellow men, he was intolerant only of carelessness or bad work or of anything savouring of intellectual dishonesty. Had London claimed him he might have proved too humble to be an impressive teacher, but his eager interest in medicine, his methods and his results would anywhere have ensured, as they did among his seniors, contemporaries and juniors in the profession, a loyal following of grateful students. His service in his allotted sphere may well have been more valuable than if chance had attached him to a teaching school.

"In his life and its general plan and purpose his conduct was as true as in his science and surgery. Essentially religious, in the word's best sense, he passed in his later years from the orthodoxy of his early upbringing to a rationalistic and philosophical mode of thought. His sympathy engendered of human suffering witnessed here and now, his biological outlook, his honesty of mind, his belief in the ultimate power of science and reason compelled this change. In a last letter to a friend written from his sick-bed he spoke of his 'faith in the essential goodness of the common people, a faith that an age-long process is at work making for the greater happiness and welfare of humanity at large, a faith in toleration and freedom, a faith in the ultimate triumph of human reason and understanding.' We may be glad that he did not survive to see Europe in worse disruption.

"Fly-fishing and bell-ringing were his relaxations. A year or two ago, never having climbed before, he accompanied his eldest son on some difficult rock-climbs in the Welsh mountains. He was fond of camping holidays with his jolly family. He had a deep love of natural beauty. He leaves a widow and four children—two sons destined for his own profession and one daughter a nurse. He was educated at Cambridge (where he obtained a first class in the natural sciences tripos) and at St. Bartholomew's Hospital.

"Living so intensely, toiling so incessantly at the anxious tasks of his calling, it is no matter for surprise that the years took early toll of his physique and that he died of a coronary thrombosis at the age of 57. His small, strong figure, his welcoming smile and handshake, his active understanding mind will leave a cherished picture in the thought of his patients, his colleagues and his friends, whose sympathy for his wife and children and all dear to him will only be heightened by their own sense of personal loss."

THE LATE SIR HENRY LUNN

WHEN his final illness began, Sir Henry Lunn had just completed the cruise of the *Letitia* from Glasgow to Toulon by way of the West Indies, and he would have accompanied the Hellenic Travellers' Club (which he had founded in 1909) to Epidaurus and Cos. A member of the ship's company writes of him as follows: "Although it would not be quite true to describe him as a doctor who never practised and a parson who never preached it has quite truly been said that Lunn gave to thousands of English-speaking people a less parochial and insular view of peoples of other lands, so helping them to understand each other better. His medical work was done fifty years ago and his recent contact with the profession was on the Hellenic cruise in early spring, frequented by the doctor on holiday. On the *Letitia* he was the mainspring of the ship's life; he knew everyone and everyone knew him; and he would wander from group to group ready with a fund of quips and anecdotes. And he was always watchful—quick to check any little difference that might arise to mar the harmony of the cruise: a benevolent presence but definitely a dictator. 'Never lower your sail in the face of danger' was often on his lips. It was characteristic of the man, for if he knew fear he scorned it."

MEDICAL NEWS

University of London

Mr. G. A. D. Haslewood, Ph.D., has been appointed to the university readership in biochemistry at Guy's Hospital medical school.

Dr. Haslewood, who is 28, was educated at St. Marylebone Grammar School and University College, London. He obtained his B.Sc. with first-class honours in chemistry in 1931, his M.Sc. in biochemistry in 1932, and his Ph.D. in chemistry in 1933. From 1931 to 1932 he did research work in the biochemistry department at University College and also acted as demonstrator in teaching medical students. From 1932 to 1933 he held a grant from the Department of Scientific and Industrial Research, and in 1933 he was awarded a Donner foundation grant at the research institute of the Cancer Hospital. Since 1935 he has been assistant in pathological chemistry at the British Post-graduate Medical School. His published work includes papers on turbidimetric estimation of protein and microchemical blood analysis.

The degree of D.Sc. has been conferred on Dr. Mary Lucas Keene, professor of anatomy in the university at the Royal Free Hospital.

University of Dublin

Dr. E. A. Bennet has been appointed lecturer in psychological medicine at Trinity College. He will visit Dublin during each summer term to give his courses of lectures.

Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—D. E. Harken, A. N. Kalra, S. Smith, and A. B. Taylor.

Medicine.—T. Bliss, G. R. Green, D. E. Harken, and H. Woolwich.

Forensic Medicine.—T. Bliss, G. R. Green, D. E. Harken, and H. Woolwich.

Midwifery.—R. M. J. Franks, T. L. B. Iredale, G. L. L. Reynolds, R. G. Ticehurst, and M. Whitehead.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery and midwifery: G. R. Green, St. Mary's; D. E. Harken, Harvard; A. B. Taylor, Lpool; R. G. Ticehurst, Camb. and Guy's; and M. Whitehead, Roy. Colleges, Edin., and West Lond.

Guy's Hospital

Mr. W. E. Gaunt, Ph.D., has been appointed to a dental research fellowship in the medical school of this hospital.

University of Sheffield

At recent examinations the following candidates were successful :—

FINAL EXAMINATION FOR THE DEGREES OF M.B., CH.B.

Parts I and II.—E. F. Edson (with first-class honours); Dan Bradbury (with second-class honours); Ailsa B. Atkinson, Percy Baker, Una M. Campbell, Harold Cohen, Louis Debovitch, H. R. W. Hawson, J. H. Hazeldene, W. F. Mindham, Ben Ravitz, and F. R. Zadik.

University of Leeds

At recent examinations the following candidates were successful :—

M.D.

T. Simpson (with distinction); D. M. Leiberman, N. Lissimore, and K. O. Milner.

FINAL EXAMINATION FOR M.B., CH.B.

Part II—J. M. Fitton, C. Pickard, and P. E. R. Tattersall, (first-class honours); C. E. Astley, P. D. Bedford, Patricia M. Dobinson, J. Hirst, F. Jennings, S. A. Swanson, R. P. Warin, and K. D. Wood (second-class honours); A. N. T. Aikman, A. Colbert, J. B. Coltman, E. Cope, F. Debney, R. G. Denniss, Ruth Edmonds, M. Goldberg, F. Gouldsborough, A. Green, H. J. M. Holland, J. Jackson, Adelaide J. G. James, R. E. Johnson, H. Levine, D. E. Mitchell, I. G. W. Pickering, J. D. Pickup, T. B. Purdy, G. N. Reed, J. V. Schofield, Helen M. Secker, F. N. Shuttleworth, Ida M. Shuttleworth, S. A. Smith, E. S. Tan, A. L. Taylor, P. J. Waddington, and I. Young.

B.CH.D.

D. C. Hall.

L.D.S.

D. W. Branter, C. R. Cornish, E. I. Friend, M. S. Harrison, L. Hodgson, A. D. McIntyre, E. S. Midgley, H. Rawnsley, A. J. W. Turrell, Margaret Williams, and C. Woodhead.

D.P.M.

Janet F. Henderson, Joyce E. Marshall, and M. W. Robinson.

University of Liverpool

At recent examinations the following candidates were successful :—

D.M.R.E.

Part A.—J. H. Fairweather and B. M. Maxwell.

D.P.H.

Part I.—J. C. Birchall, C. Coleiro, E. C. R. Couper, J. N. Das, Beryl Edgecombe, Ivy F. Fallon, Elsie O. Hughes, J. Leiper, F. T. Madge, E. H. Moore, and Moira Murray.

D.T.M.

J. J. Barton, B. S. Baswani, T. G. Burnett, J. M. Caldwell, G. N. Dholabhai, L. G. Eddey, A. H. T. F. Fullerton, W. Hunter, S. D. Khalil, V. N. Khanna, J. Koniszewski, E. Kowalsky, W. H. R. Lumsden, K. Nadarajah, H. Nelson, T. E. Ooi, T. S. Outerbridge, W. A. de Pay, R. Singh, A. Sundrampillai, and L. Teeluck.

D.T.H.

A. S. Affara, L. J. Charles, H. N. Lee, H. R. R. E. Ramesar, and A. H. D. S. de Silva.

Dr. A. H. T. F. Fullerton and Dr. T. E. Ooi were recommended for the Milne medal.

Royal College of Obstetricians and Gynæcologists

The following candidates have satisfied the examiners and have been awarded the diploma of the College :—

F. S. Bonugli, Alexander Buchan, J. W. Brown, Violet Conway, J. G. B. DeVine, Norman Dodd, Mary N. Fawcett, Richmond Edwards, G. H. Ellidge, J. E. Elliott, J. F. Fraser, Audrey I. Freeth, E. G. Collins, Evelyn W. Glennie, Alan Grant, D. H. Harrison, R. L. Hartley, D. W. Hendry, Eugenie C. Illingworth, James Kay, R. F. Lawrence, J. T. Mair, Mary D. Mellersh, Gardiner Mitchell, I. H. C. Morton, Robert Pollok, Florence G. Richards, Robert Roaf, Ada M. Sewell, and Helen Thomson.

Royal Free Hospital

Applications for the following postgraduate scholarships are invited from former students of this hospital :—

A. M. Bird Scholarship.—£200 for one year to enable a medical graduate to obtain general experience in pathology.

Mabel Webb and A. M. Bird Research Scholarship.—£200 a year for assistance in carrying on research.

Further particulars may be had from the warden and secretary of the medical school.

Food Education Society

In announcing last week the two lectures to be given to this society this month, Dr. E. C. Pillman-Williams's lecture on diet and rheumatism to be delivered on April 19 should have been described as the Bircher-Benner memorial lecture. The second lecture will be given by Sir Albert Howard on April 26; he will speak on health, nutrition, and soil fertility. Both lectures will be held at 8 P.M. at the London School of Hygiene, Keppel Street, W.C.1.

Microchemical Club

The following officers have been elected : hon. librarian, Miss Isobel Hadfield; hon. treasurer, Mr. L. H. N. Cooper, Ph.D.; hon. secretary, Mr. W. F. Stephenson; members of committee, Miss M. Corner and Mr. J. R. P. O'Brien. The secretary of the society may be addressed at Medway Technical College, Gillingham, Kent.

Functions of Hospitals in War-time

Addressing a meeting in Birmingham on March 20, Mr. Walter Elliot said that in making plans for the use of hospitals in a national emergency the Ministry of Health realised the important effect of efficient hospital service on the general morale. As reported in the *Birmingham Post*, he went on to say that in time of war it is not proposed to keep the ordinary hospital service reduced below its normal level for any length of time. The Ministry had it in mind, he said, that the ordinary inflow of patients displaced at the outset of an emergency would in a few weeks accumulate again, and would require hospital treatment, and must be catered for.

Use of Analgesics by Midwives

In the report of the Central Midwives Board for the year ended March 31, 1938, which has just been issued (H.M. Stationery Office, 4*d.*) it is stated that during the year the board approved 18 institutions for instruction in obstetric analgesia and in the use of a recognised apparatus for the administration of gas and air by midwives. This brought the total number of institutions so approved up to 32. A midwife may now receive this instruction as part of the compulsory post-certificate course which she must attend every 7 years, provided the duration of the course is extended from 4 to 5 weeks. Four types of apparatus are now recognised by the board.

National Fitness Council for England and Wales

The medical committee of this council have appointed two subcommittees. The first under the chairmanship of Sir Adolphe Abrahams will investigate the effect of violent exercise on girls and women from the physical, the nervous and the psychological point of view. The second under the chairmanship of Dr. G. E. Friend will study the criteria of fitness at present applied to different sections of the community. The "criteria" committee are considering a form which might be used as a basis for the medical examination of adolescents, particularly members of voluntary clubs and youth organisations, so that records from various sources can be correlated.

Association of Industrial Medical Officers

This association met on March 24 at the London School of Hygiene and Tropical Medicine, with Dr. L. P. Lockhart, the president, in the chair. A discussion on Factory Construction and Health was opened by Sir Owen Williams from the standpoint of the engineer and architect. Starting from physiological and physical principles he reviewed the function of a building as a means of protection from the elements, and remarked that the problem before the heating engineer was not "how much should this building be heated?" but "how much should the occupants be cooled?" (from their normal blood-heat). Sir Owen approved the maxim that the sky should be visible to every worker and said that the choice between single-storied and many-storied factories should depend entirely on the work to be done. He condemned what he called eye appeal, and thought that colour schemes should be based on use; thus "attractive" colours such as red and orange should be painted on parts of the building or machinery of which the worker should be kept aware, while "distractive" colours such as green served for the rest. Colonel A. W. Garrett, deputy chief inspector of factories, said that in planning factories a great deal of subsequent trouble would be saved if the technical experts who were going to use the building would tell the architect what they needed and what they would probably need in a few years' time if their work and machines continued to evolve. He had formed the impression that the immense rooms of the large single-story factory are exceedingly difficult to ventilate at the centre.

A discussion followed in which the heating and flooring of factories was considered, together with the avoidance of noise, environmental monotony and needless labour.

Exhibition of Cripples' Work

The fifth International Exhibition of Cripples' Work will be held in London in October, 1939, under the auspices of the Central Council for the Care of Cripples, 34, Eccleston Square, London, S.W.1. Work done by crippled persons in workshops, hospital schools, training colleges, and home industries will be displayed and will be eligible for competition for diplomas and trophies.

Spanish Refugees in France

Facilities have been afforded by the French government for the import of goods for these refugees duty-free through the red-cross organisation. General Ihler who is in charge of the camps at Perpignan has asked for shirts, underclothes and blankets, and since February many bales of goods have been sent from this country. Towels, cigarettes, tinned food, soap, and cotton-wool have also been dispatched. A recent consignment consisted of 16,500 blankets, 6000 shirts and 2500 pairs of trousers. Special quarters for baling these goods have been taken over by the British Red Cross Society at 15a, Grosvenor Crescent Mews, London, S.W.1, and the society is now making an appeal both to manufacturers and to the public to help them in their task of aiding the French in their humane undertaking.

Emergency Bed Services in Liverpool and Birmingham

A central bureau to arrange the admission of urgent cases to hospital was opened in Liverpool last week. The bureau is situated in the Royal Infirmary and works on the lines of the service that has been so successful in London. An indicator board showing the available beds is kept up to date by regular reports from the hospitals, and the bureau is linked by private telephone lines to all the major hospitals that serve the city. General practitioners can thus find where a bed is available and arrange the admission of an emergency to any of the general, special or municipal hospitals by one telephone call. The bureau is open day and night, and is to be linked up with the Merseyside ambulance services.

A subcommittee of the Birmingham hospitals council has reported in favour of the establishment of a similar bureau there, and the council approved the scheme at their meeting on March 24. The details are to be worked out by a committee consisting of representatives of the public-assistance and public-health committees, the hospitals council, the contributors' association and Hospitals Saturday Fund, the voluntary hospitals, and general practitioners. The public-health committee are to place 5 of their 7 ambulances at the disposal of the bureau.

A Blood-Bank at Manchester

A scheme has been approved at the Manchester Royal Infirmary for instituting a "blood-bank" or reserve of stored blood. The blood will be drawn from donors of groups A (2) and O (4), and is to be used primarily for emergency cases and especially for transfusions required during the night or at week-ends, when there may be delay or difficulty in getting donors through the ordinary service. It is also intended that the scheme should form a nucleus, capable of large development in time of war. The donors, who are to be examined regularly so as to minimise the risk of infection, will be obtained as usual through the voluntary transfusion service, but they will attend at times convenient to themselves. After storage for seven days, blood not required for emergency cases will be used for routine transfusions; this will avoid wastage. Dr. R. W. Fairbrother, director of the clinical laboratory of the hospital, informs us that transfusions are being required more frequently, and points out that while the ordinary service is generally satisfactory, loss of time in securing a donor may have serious results in the occasional case of sudden and intense hæmorrhage. We understand that more systematic training is to be given to students and others in the technique of blood-transfusion, and that questions involved in the storage of blood will be investigated.

Dr. Jacob Goldman, resident chemical pathologist at the hospital, has been appointed full-time resident blood-transfusion officer.

The Tuberculosis Service in War-time

The Joint Tuberculosis Council has issued a memorandum pointing out that the incidence of tuberculosis would probably increase in war-time owing to the dispersion of tuberculous persons, shortage of food, the strain of active service and overtime work on munitions, and increased employment of tuberculous persons. Extra provision must be made not only for dealing with this increased incidence but also for accurate diagnosis among those called up for service. For this reason a specialist tuberculosis medical service should be kept in being, if only in skeleton form, and plans should be published beforehand concerning the transference of tuberculosis specialists to other duties. Similar considerations apply to the nursing staff of dispensaries and institutions. Due regard must also be paid to the influx of an evacuated population. This would entail a rearrangement of dispensaries, and, if necessary, neighbouring local authorities could combine their services. More attention should be paid to radiography by experts as a form of diagnosis that is not only very valuable but, in comparison with the examination of sputum, saves time and excludes the traffic in "positive" sputum that took place during the late war. The Government should therefore take steps to ensure the supply of plant, films, and other necessary material. The Ministry of Food should allow extra nourishment for tuberculous patients.

This memorandum, which is signed by Dr. Lissant Cox, Dr. J. C. Gilchrist, Dr. J. B. McDougall, Dr. Lloyd Rusby and Dr. James Watt, is obtainable (price 1*s.*) from the hon. secretary of the council, at Preston Hall, near Maidstone, Kent.

Appointments

BROWN, ARNOLD, M.B. Manc., D.P.H., medical officer of health for Congleton borough.
BRYSON, THOMAS, M.B. Glasg., interim medical superintendent at Glasgow Royal Infirmary.
CRAIG, W. JOHNSTON, M.B. Dubl., hon. radiologist to Poplar Hospital, London.
DAWKINS, C. J. M., M.D. Camb., D.A., hon. anæsthetist to University College Hospital, London.
DIGGLE, GORDON, M.B. Edin., M.R.C.P.E., assistant medical officer at the County Mental Hospital, Rainhill, Lancs.
HARRIS, J. R. GLANFIELD, M.B. Camb., D.A., hon. anæsthetist to University College Hospital, London.
HESTER, K. H. C., M.B. Lond., F.R.C.S., hon. surgeon to the St. Albans and Mid-Herts Hospital.
HISLOP, J. C., M.B. Edin., F.R.C.S., resident surgical officer at King George Hospital, Ilford.
HUGHES-DAVIES, V. S., M.B. Lpool, D.C.H., medical officer at the Poor Law Infirmary and Institution, Bath.
LATTER, K. A., M.D. Lond., M.R.C.P., hon. physician to the Norfolk and Norwich Hospital.
MCKISSOCK, WYLIE, M.S. Lond., F.R.C.S., hon. associate neurological surgeon to the Hospital for Sick Children, Great Ormond Street.
PARKMAN, T. H., M.B. Lond., D.P.H., deputy medical officer of health for Eastbourne.
PYCRAFT, W. E., M.B. Lpool, assistant medical officer at the County Mental Hospital, Rainhill, Lancs.
ROBSON, KENNETH, M.B. Camb., M.R.C.P., medical registrar at the Brompton Hospital for Consumption.
ROSS, MARGARET M., M.B. St. And., resident surgical officer at St. Anne's Hospital, Altrincham.
SMITH, S. R. NAISBY, M.B. Aberd., resident surgical officer at the Royal Infirmary, Blackburn.
•WILLOUGHBY, H. M., M.R.C.S., D.P.H., D.T.M. & H., deputy medical officer of health for the Port of London.

Vacancies

For further information refer to the advertisement columns

Army Dental Corps.—Dental surgeons.
Aylesbury, Bucks Mental Hosp.—Asst. M.O., £350.
Bedford County Hosp.—Sen. H.S. and Cas. O., each at rate of £150.
Bexhill Hosp., Bexhill-on-Sea.—Res. M.O., at rate of £150.
Birkenhead, Clatterbridge (County) General Hosp.—Jun. res. asst. M.O., at rate of £250.
Brighton, Royal Sussex County Hosp.—Cas. H.S., £120.
Bristol City and County.—Asst. M.O.H., £500.
Burnley County Borough.—Asst. M.O., £500.
Bury County Borough.—Asst. M.O.H., £500.
Cardiff, Welsh National School of Medicine.—Demonstrator in dept. of pathology and bacteriology, £250.
Chester Royal Infirmary.—H.S. to orthopædic dept., £150.
*City of London Maternity Hosp., City Road, E.C.*1.—Asst. physician to children's dept., 1 guinea per attendance.

• Subject to confirmation.

Colonial Medical Service.—Medical officers.
Doncaster Royal Infirmary.—Res. surg. O. and orthopædic H.S., at rate of £250 and £150 respectively.
Dublin, Charitable Infirmary, Jervis Street Hosp.—Visiting surgeon.
Dudley Guest Hosp.—Cas. H.S., £150.
Exeter, Wonford House Registered Hosp.—Asst. M.O., £350.
Exminster, Devon County Mental Hosp.—Med. supt., £1000.
Glasgow, Woodilee Mental Hosp., Lenzie.—Second asst. res. M.O., £300.
Guildford, Royal Surrey County Hosp.—H.P. and cas. O., at rate of £150.
Herefordshire General Hosp.—H.S. for cas., and ear, nose, and throat depts., £100.
*Hosp. for Consumption, &c., Brompton, S.W.*3.—Res. surg. O., £150. Asst. res. M.O., at rate of £150. Also three H.P.'s, each at rate of £50.
*Lambeth Metropolitan Borough, S.W.*2.—Deputy M.O.H., £840.
Lancaster, Royal Albert Institution for the Feeble-minded.—Res. jun. asst. M.O., £375.
Lanchester Joint Hosp. Board.—Med. supt. for infectious hosps., £750.
Leeds Public Dispensary and Hosp.—Res. surg. O., £200. Ophth. and aural O. and three H.P.'s, each at rate of £150.
Leeds, St. James's Hosp.—Three H.P.'s, each at rate of £150.
Leicester Royal Infirmary.—Hon. surgeon.
Lincoln City.—Asst. M.O.H. and asst. school M.O., £500.
Lindsey County Council, &c.—Obstetric and gynæcological consultant, £700.
*London Chest Hosp., Victoria Park, E.*2.—**Physician to inpatients.**
London County Council.—Asst. M.O. (Class I), £350. Asst. M.O.'s (class II), each £250. Also asst. district M.O.'s, £175–£150.
*London Hosp., E.*1.—Supervisor of outpatient operations, at rate of £200. Surgical and medical outpatient first assts., each £150. Also hon. asst. anæsthetist.
Macclesfield, Cheshire County Mental Hosp., Parkside.—Asst. M.O., £350.
Manchester, Baguley Sanatorium.—Jun. asst. M.O., at rate of £250.
Manchester, Booth Hall Hosp. for Children.—Res. surg. O., £400.
Manchester, Christie Hosp. and Holt Radium Institute, Withington. Pathologist, &c., £600.
Manchester, Park Hosp., Davyhulme.—Asst. res. M.O. and jun. asst. res. M.O., at rate of £300 and £250 respectively.
Manchester Ear Hosp., Grosvenor Square, All Saints'.—H.S., at rate of £150.
Manchester Royal Infirmary.—Two H.S.'s to spec. depts., each at rate of £50. Also hon. asst. aural surgeon.
*Metropolitan Hosp., Kingsland Road, E.*8.—Cas. O. and res. anæsthetist, £100.
*Middlesex Hosp., W.*1.—Res. M.O., £400.
*Mildmay Mission Hosp., Austin Street, Bethnal Green, E.*2.—Asst. cas. O., at rate of £140.
Newark General Hosp.—Res. H.S., at rate of £175.
Newcastle-upon-Tyne City and County.—Maternity officer, £800.
Newport County Borough.—Asst. M.O.H., £600.
*North Middlesex County Hosp., Silver Street, N.*18.—Asst. M.O., at rate of £350.
Nottingham General Hosp.—H.S. to orthopædic and fracture dept., at rate of £150.
Nottingham Hosp. for Women.—Hon. asst. surgeon.
Nottingham and Midland Eye Infirmary.—Res. H.S., £200.
*Paddington Green Children's Hosp., W.*2.—H.P. and H.S., each at rate of £150.
Plymouth City General Hosp.—Asst. M.O., £300.
*Poplar Hosp., East India Dock Road, E.*14.—Jun. H.S., at rate of £100.
Portsmouth, Saint Mary's Hosp.—Jun. asst. res. M.O., £250.
*Queen Mary's Hosp. for the East End, Stratford, E.*15.—Registrar to ear, nose and throat dept., 50 guineas.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Royal Air Force.—Commissions.
*Royal Cancer Hosp., Fulham Road, S.W.*3.—Sen. asst. radiologist for therapeutic section of radiological dept., £450. Also radiologist, £400.
*Royal College of Surgeons of England, Lincoln's Inn Fields, W.C.*2.—Election of professors and lecturers.
*Royal Eye Hosp., St. George's Circus, S.E.*1.—Officer i/c children's treatment clinic and O.P. refraction officer, each £80.
Royal Naval Medical Service.—M.O.'s.
*Royal Northern Hosp., Holloway, N.*7.—H.P., at rate of £70.
St. Albans County Institution, Oster House.—H.S., £175.
*St. Bartholomew's Hosp., E.C.*1.—Hon. instructor for speech defects, &c.
*St. John's Hosp., Lewisham, S.E.*13.—Orthopædic registrar, 35 guineas.
St. Thomas's Hosp.—Asst. director of radiotherapy. Also sen. and jun. radiologists, £600 and £400 respectively.
Salford, Infectious Diseases Hosp.—Jun. asst. res. M.O., £200.
Staffordshire Mental Hosp., Cheddleton, near Leek.—Jun. asst. M.O., £500.
Surrey County Council.—Asst. M.O., £600.
Swansea County Borough.—Asst. M.O.H. and asst. school M.O., £500.
Taunton and Somerset Hosp.—H.S., at rate of £125.
Tilbury Hosp., Essex.—H.S., at rate of £140.
*University College Hosp. Medical School, W.C.*1.—Beit Memorial fellowships for medical research, each £400.
Ventnor, Isle of Wight, Royal National Hosp. for Consumption, &c. Asst. res. M.O., at rate of £250.
Walsall, Manor Hosp.—Jun. asst. M.O., £150.
*West London Hosp., Hammersmith, W.*6.—Chief clin. asst. in X-ray (diagnostic) dept., £125. Also res. cas. O. and res. anæsthetist, each at rate of £100.
*Westminster Hosp., Broad Sanctuary, S.W.*1.—Hon. appointments.
Wolverhampton Royal Hosp.—H.S. for fracture and orthopædic dept., at rate of £100.

Medical Diary

April 3 to April 8

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.

TUESDAY.

Orthopædics and Neurology. 8.30 P.M., Dr. J. Grafton Love (Mayo Clinic) and Dr. C. P. Symonds: Prolapsed Intervertebral Discs. Dr. J. L. A. Grout, Dr. F. Campbell Golding, and Mr. Geoffrey Jefferson will also speak.

Psychiatry. 9 P.M., Prof. C. G. Jung: Scope and Limitations of the Genetic Factor.

WEDNESDAY.

Surgery. 8.30 P.M., pathological meeting. Specimens will be on view from 5 P.M.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF BIRMINGHAM.

TUESDAY.—4 P.M. (Queen Elizabeth Hospital), Dr. James Smellie: Infantile Diarrhœa. (Last Ingleby lecture.)

UNIVERSITY OF GLASGOW.

TUESDAY.—4.30 P.M. (Tennent Memorial Building, Church Street), Dr. I. Chesar Michaelson: The Eye in the Disorders of Internal Secretion.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.

TUESDAY.—4.30 P.M., Dr. C. M. Hinds Howell: Syphilis of the Nervous System.

WEDNESDAY.—NOON, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical).

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological conference. 3.30 P.M., Mr. Charles Read: Sterility.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

TUESDAY.—5.15 P.M. (Brompton Hospital, S.W.3), M.R.C.P. course in chest diseases.

LEEDS GENERAL INFIRMARY.

TUESDAY.—3.30 P.M., Dr. J. R. H. Towers: The Heart of Middle Age.

Births, Marriages and Deaths

BIRTHS

BATHURST NORMAN.—On March 21, at Eton, the wife of Dr. Harry Bathurst Norman—a daughter.

BENTLIF.—On March 24, the wife of Dr. Graeme Bentlif, of Jersey, C.I.—a daughter.

BROOK.—On March 24, at Barnstaple, the wife of Dr. Stanley Gordon Brook—a son.

GALLIMORE.—On March 21, at Basingstoke, the wife of Dr. Robert Gallimore—a son.

GILLIES.—On March 23, at Tavistock, the wife of Dr. T. D. Gillies—a son.

HARGREAVES.—On March 21, at Bentinck Street, W.1, the wife of Dr. R. Hargreaves—a daughter.

MARKBY.—On March 25, the wife of Mr. C. E. Puckle Markby, F.R.C.S., of Bournemouth—a son.

PATERSON.—On March 25, at Philadelphia, U.S.A., the wife of Dr. John F. Paterson, of Little Baddow, Essex—a daughter.

PEARSON.—On March 21, at Welbeck Street, the wife of Dr. J. E. G. Pearson—a daughter.

PIMM.—On March 27, at St. Augustine, Trinidad, the wife of Dr. Gerald Pimm—a daughter.

PROCTOR.—On March 24, at Plymouth, the wife of Surgeon Commander R. L. G. Proctor, R.N.—a daughter.

THORNE.—On Jan. 25, at Karachi, the wife of Captain W. H. A. Thorne, I.M.S.—a daughter.

WELFORD.—On March 26, at St. Peter's Square, W.6, the wife of Dr. C. R. B. Welford—a son.

WIGFIELD.—On March 26, at Buntingford, Herts, the wife of Dr. Alan Wigfield—a son.

DEATHS

CUMBERBATCH.—On March 24, at St. Bartholomew's Hospital, London, Elkin Percy Cumberbatch, M.A., B.M. Oxfd, F.R.C.P., of Manchester Square, W.1.

EARLY.—On March 25, at Hoylake, Philip Vanner Early, M.B. Lond., M.R.C.S., aged 52.

HARBINSON.—On March 26, at Matlock, George Casement Reid Harbinson, M.B. R.U.I.

MCCALL-ANDERSON.—On March 24, in New York, Thomas McCall-Anderson, M.D.

MARSHALL.—On March 28 at Holmbury, Thorncliffe Drive, Cheltenham, William Lawrence Wright, C.M.G., M.R.C.S., J.P., consulting surgeon, the Royal Infirmary, Huddersfield, aged 79 years. Funeral service at Christ Church, Cheltenham, on Friday, 12.30 P.M.

WALMSLEY.—On March 24, at Lidden, Penzance, Robert Garrett Walmsley, M.B. Lpool.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

GOOD QUALITY IN MEDICAL CARE*

By J. Rosslyn Earp, M.A., M.R.C.S., Dr.P.H.

You are consumers of medical care, and I want to utter a simple warning: *caveat emptor*. Be careful that we do not sell you a pup.

How are you going to judge the quality of medical care which any given scheme proposes to purvey to you? Can a layman pass judgment on so esoteric an art? I admit that this is not easy but I suggest that just now it is very important that you set up a bureau of standards.

How can you measure quality? You will be told that it is essential to preserve free choice of doctor. The reason advanced is that this leads to a certain physician-patient relationship without which good-quality care cannot be had. The argument about free choice of doctor reminds me of an argument heard in my Victorian youth about free choice of husband. It was the Anglo-Saxon tradition that no-one should come between the young woman and the young man in the arrangement of a marriage. The continental tradition on the other hand has been that the experience of their elders was a safer guide than the impulses of youth. I do not attempt to judge between these traditions: I observe simply that in my experience the success of marriage has depended more upon the kind of people who were married and upon the attitude of each to the other than upon the nature of their introduction.

I do not underrate the doctor-patient relationship. I have had patients who have honoured me with confidence and friendship. I agree that such confidence is in many cases a prerequisite of good medical care. But I also believe that it depends more upon the kind of man who is doctor, the kind of man who is patient, and their attitude one to another, than upon the manner in which they are introduced to each other.

I submit three standards that I hold to be of more importance than free choice of doctor:

(1) That all consumers everywhere should have access to the latest equipment provided by scientific discovery for the purposes of diagnosis and treatment.

(2) That whenever consultation is needed the advice of qualified specialists shall be speedily obtainable.

(3) That all doctors ministering to the medical needs of the public shall be informed of modern medical procedure and competent to take advantage thereof.

It is now 22 years since I graduated in medicine. The advance in the technology of medicine during those years has been breath-taking. The education I received from 1910 to 1917 by no means fits me to practise medicine today. The other day I was talking to a doctor who had just been looking through a gastroscope and was filled with amazement by what it is now possible to see of the inside of the stomach. I have never seen the inside of a living stomach nor even this new instrument which makes it visible. I learned how to recognise pulmonary tuberculosis with my eyes, my hands and my ears aided only by a stethoscope. Today I know that tuberculosis must be seen in the X-ray film since it cannot be heard in time. Only by postgraduate study have I acquired some ability to read the evidence on an X-ray film. Many of the skills which I acquired by long practice in the course of my medical education are now relatively unimportant. I spent hours in clinical surgery learning to distinguish by the use of my hands a malignant lump in the breast from a harmless lump. Whatever skill I acquired is now valueless. No lump should be allowed to stay long enough for me to be able to tell you that it is cancer. Every tumour should be removed and examined under the microscope by an expert pathologist.

On the other hand, new knowledge, new skills have become essential to the practice of medicine and not all doctors have found time to go back to school. Above all there has been a revolution in our conception of the responsibility of the doctor to forestall encroaching disease. In my youth it was good enough to treat the patient when he came to you with symptoms: in pain, or breathless or wasted to a skeleton. Now we know that if we are to save health and life we must treat syphilis, cancer, tuberculosis, heart disease—yes, the commonest causes of death and invalidity—we must treat them before symptoms are apparent. This means a new conception of medical care. The school-teachers are kept up to date by compulsory refresher courses from which they are obliged to obtain "credits." As at present organised medical practice provides no convenient summer holiday for refresher courses. Hospitals are not organised to provide continuous access by all physicians to the implements of scientific medicine and the faculties of medical schools are mostly engaged in teaching undergraduates. But there is no good reason why postgraduate education for school-teachers should be provided and required while postgraduate education of physicians is left to detail men from the drug houses.

It will pay you consumers to give us doctors a chance to keep ourselves up to date. Then if we do not take our chance we should expect no mercy from you.

* From an address delivered to the Conference on Human Needs in New York City, March 11–12, 1939.

STREET ACCIDENTS

In the course of a discussion on street accidents by the Medico-Legal Society on March 23 Dr. Gerald Slot suggested the medical examination of candidates for driving licences, special attention being paid to vision and hearing, since defects in these senses and other physical disabilities of drivers are responsible for some accidents. In examining pedestrians hit by fast-moving vehicles it should be remembered, he said, that internal injuries might be far from the surface wound, owing to the speed of impact. As much information as possible should be collected at the time so that an accurate history could be pieced together. It was necessary to discriminate at post-mortem examinations between injuries due to the accident and injuries sustained before the accident, which might have caused it. Dr. Slot advocated the introduction of a system of notification and filing of the histories of all motor accidents and the adoption of the American practice of arranging for all ambulances to carry doctors. The hospital resident faced with a serious casualty should not hesitate to call in a senior man to deal with it. The treatment at hospitals of accidents to well-to-do patients involved considerable loss of income to private doctors; nor did the doctors attached to the hospitals get sufficient recompense for their trouble. Attendance at the law-courts during actions for damages was another source of loss when the suit was prolonged, and the uncertainty when a case would be heard sometimes kept a doctor waiting about idle for two or three days. It had been established that a verbal promise

by the party responsible for the accident to pay a doctor for treating the injured person was legally binding.

Colonel Walter Parkes observed that the cost to voluntary hospitals of road accidents was some £300,000 per annum, of which only about £100,000 was recovered from insurance companies, since most settlements did not allow for payment to hospitals. He suggested the addition of 2*s.* to the cost of a driving licence to provide a central fund for the treatment of road casualties and the payment of hospitals and doctors concerned with them. Captain G. M. Eden said that hospitals often had difficulty in obtaining the accident emergency fee of 12*s.* 6*d.*; they should be given a grant from the Road Fund and should combine to form a common organisation for dealing with road accidents. Other speakers supported the idea of a central fund and one observed that the insurance company was responsible for the accident emergency fee.

TUBERCULOUS PERITONITIS

THE work of the Swiss pioneers of heliotherapy, Bernhard of St. Moritz and Rollier of Leysin, is widely known, but Rollier's latest publication (Rollier, A., and Leuba, W., *Tech. chir.* February, 1939, p. 1) is particularly valuable because it draws attention to the essential rôle of correct technique in the treatment of tuberculous infection of bowel and peritoneum. The area of skin exposed and the length of exposure are determined by the improvement in the general and local conditions, and by the cutaneous reactions, especially the amount of pigmentation. Exposure of the abdomen must be avoided in the early stages of treatment and is only permitted after prolonged exposures of the legs are well tolerated. Infringement of this rule spells disaster, there is deterioration in the general condition and diminished resistance of the patient to the local inflammatory process. Rollier's results are recorded in a series of photographs comparing the appearance of the patients before and after treatment. They show healing of multiple fæcal fistulæ, closing of tuberculous sinuses, absorption of effusions, and disappearance of tuberculous masses, with an astonishing change in the patients' appearance from advanced cachexia to flourishing good health and excellent physique.

TREATMENT OF FRACTURES IN CAIRO

THE Red Crescent Hospital in Cairo, which receives accident cases only, has issued its first annual report. In a foreword Mr. M. Kamel Hussein, the surgeon in charge, explains that the steady increase in the number of road accidents and the concern to deal fairly with disabled workers were the two factors that decided the authorities to open the hospital. It has already outgrown the capacity of its original 56 beds, and new accommodation, which will give the hospital 125 beds, is under construction. The methods used in the treatment of fractures are in the main those of Böhler, with minor modifications. Mr. Hussein would be "very happy if doctors would discard for ever" the following ideas: (1) that massage helps union; (2) that early passive movement is useful in fractures involving joints, even at the expense of accurate reduction; (3) that a certain fracture means a certain splint; (4) that plaster-of-paris, correctly applied, causes stiffness of joints and atrophy of muscles; and (5) that infected open fractures should be energetically treated for infection, the treatment of the fracture being postponed till the wound is healed. He is a firm advocate of plaster-of-paris, but only of the plaster applied without padding. The safest plaster, he says, is one applied skin-tight, so that the shape of the limb is easily recognisable on the plaster, the malleoli and patella, for example, being visible through accurate moulding over their contour. Such a plaster has no chance of rubbing or slipping, and can be applied thin so as not to embarrass the use of the limb by its weight. In compound fractures plaster is the sheet anchor of treatment. In the practice of the Red Crescent Hospital it is considered criminal to treat the infection first and the fracture later. Immediate operation is the rule. The edges of the wound are excised, necrotic and badly injured tissues are removed, and the wound is closed unless the danger of infection is obviously too great. Traction is then applied, and the limb, whether or not the wound has been closed, is encased in plaster. Intensive treatment of the wound by fomentations and four-hourly dressings is condemned as risking a spread of infection and liable to interfere with the position of the fractured ends. Traction on infected fractures has been applied with no harmful results.

The statistics of the hospital show that in twelve months 1770 cases were admitted, of which 796 were fractures and 384 were cranial injuries other than fractures. The methods of treatment used and the results obtained in each type of fracture are discussed by the surgeons responsible. There are four resident medical officers acting under the general supervision of Mr. Hussein. It is interesting to note that of eight cases of linear fissure of the skull explored by trephine not one showed any dural or cerebral complication. The results in the cases of depressed fracture of the skull are encouraging: 33 patients, all trephined, had an average stay in hospital of 13 days, and only 8 of them died. Drainage was used in the first case only, and then it was found unnecessary; so all wounds were closed without drainage.

FULMARS AND PSITTACOSIS

ORNITHOLOGIST writes: The discovery that the fulmar petrel (*Fulmarus glacialis*) is responsible for psittacosis in the Faroe Isles coincides with the centenary of its arrival in those islands; for about 1839 it first began to breed on the cliffs of Suderoe, whence it spread to the neighbouring isles, becoming common throughout the group by 1905.[1] Previously its range was limited (as regards this part of the world) to Iceland and St. Kilda. Shepherd,[2] describing his experiences in Iceland, wrote: "A very curious dish was served up to us for dinner. It consisted of roasted Petrels, Guillemots, and Razorbills." An early account of Iceland[3] says that 20,000–30,000 young fulmar petrels were caught annually on the Westmann Isles off Iceland, and Annandale[1] says: "In 1898, according to the statistics collected daily throughout the season, 24,229 young birds of the species were taken in the Westmann Isles. . . . Even in the Westmann Isles there are traditions that the fulmar was not always an indigene." It is not known when the fulmar first colonised either Iceland or St. Kilda, in which latter island the bird has been common for at least three centuries.[1] Newton and Gadow[4] said that at St. Kilda 18,000–20,000 young fulmars were killed annually in one week in August. Cases of psittacosis, if they occurred either in Iceland or St. Kilda, would probably have been diagnosed as pulmonary tuberculosis, which has always been rife in Iceland at least.

The Faroes lie roughly half-way between Iceland and the Shetlands, and it took another forty years for the fulmar to extend its range from the Faroes to the Shetlands. In 1879 "a dead whale reached the island of Foula, having been brought by the currents from the northern seas. On the carcase were a number of fulmars, which found a suitable nesting-ground on the island and did not return northwards."[1] That the fulmar, however, had already strayed as far as the Orkneys by 1845 is to be

1. Annandale, N., The Faroes and Iceland, Oxford, 1905, pp. 55, 106–116.
2. Shepherd, C. W., The North-west Peninsula of Iceland, London, 1867, p. 123.
3. An Historical and Descriptive Account of Iceland, Greenland and Faroe Islands, 2nd ed., Edinburgh, p. 407.
4. Newton, A., and Gadow, H., A Dictionary of Birds, London, 1896, p. 296.

understood from the remarks of Buckley and Harvie-Brown [5]: "Since Messrs. Baikie and Heddle published their book in 1845 several more specimens of the Fulmar have been obtained"—one shot in 1850, one in 1860, one in 1872, and several seen at sea. Even as late as 1907 fulmars were reported as uncommon birds in the Orkneys: "Several pairs were discovered during the past summer frequenting the cliffs between Stromness and the Bay of Skaill, in the Orkneys. This is believed to be the first record from this locality." [6] In 1897 the fulmar began to breed on the cliffs of the extreme north of Scotland,[1] and since then it has rapidly extended its range southwards. This rapid extension probably means that the well-established breeding-grounds, such as the Faroes, are very congested; hence the liability of the fulmars to disease.

The suggestion made by Haagen and Mauer,[7] mentioned in THE LANCET of March 25, that the virus of psittacosis is shaken from the wings of the young birds into the faces of their captors is belied by both the statements and the photographs published by Annandale.[1] There is no mention whatever of the young birds flapping their wings and making a dust. On the other hand, their method of defence is an example of the power of several species of birds to eject forcibly their gastric contents. The fulmar shares with other petrels the habit of ejecting at any aggressor, including man, a quantity of disgusting oil with a penetrating odour. Newton and Gadow [4] say: "Whenever a live example is seized in the hand, it ejects a considerable quantity of this oil from its mouth." "The fowlers," says Annandale,[1] "aim at stunning them before they can spit; for the young birds defend themselves in the same way as the adults and can eject their oil violently to the distance of several feet. Before doing so, however, they stretch their necks, hiss like snakes, quiver, gurgle and splutter, and finally open their beaks widely, as photographs show—and then out comes the oil." They obviously have no time for flapping wings. It is therefore possible that the virus is contained in the oil. The clothing of those who catch the young birds is described by Annandale as "stained in yellow patches with the fulmar's oil and very malodorous."

He also says that "some Faroemen appreciate the oily flesh of the bird as an article of diet, but others will not eat it; it appears to be more favoured by men than by women." It would be interesting to find out whether or how many psittacosis patients in the Faroes had partaken of the flesh of the fulmar. Much of this oil (which must not be confused with the oil ejected by the bird) is extracted by the Faroes women for various purposes, including illumination, before the flesh is used as food. This could possibly account for the cases of psittacosis in women.

TRUE CYSTS OF THE PANCREAS

TRUE cysts, as distinct from pseudo-cysts, of the pancreas are rare. L. Massé, R. Darmaillacq, and P. Darmaillacq (*Bordeaux chir.* January, 1939, p. 10) describe two cases of their own, but in the literature of the last fifteen years have found only 17 others in which the diagnosis has been established beyond doubt—that is, by histological demonstration of a lining epithelium. These cysts are, in general, an affection of adult life, though one of the published cases occurred in a child of twelve. They are commoner in women than in men and originate more often in the tail than in other parts of the pancreas. The symptoms are vague and atypical and the only pathognomonic sign is the presence of a tumour; hence errors of diagnosis are common.

Epithelium-lined cysts of the pancreas are of various types. Among the 19 cases cited by Massé and his colleagues are instances of congenital polycystic disease, so-called canalicular cysts, cystadenoma (almost always multilocular), adenocarcinoma, and cysto-epithelioma (resulting from the supervention of malignant changes in a benign cyst). The authors maintain that all the different types are neoplastic in origin, and that other suggested causes such as retention and chronic inflammation can be eliminated. They group the cysts under two heads, according as they originate from adult pancreatic tissue or from hypothetical embryonic rests derived from the intestine and remaining embedded in the pancreas during the course of development. The cysts in the former group are benign and can be cured by simple marsupialisation. The second group are always malignant; nothing short of complete removal will suffice to bring about a cure, and this is not always technically possible. Unfortunately the malignant type is the more common.

A CONSTRUCTIVE HEALTH BOOK

A GOOD and unassuming little book entitled "The Household Doctor" [1] belies its name: it makes no attempt to replace the doctor in the home, but only serves to give the ordinary man a clear idea of his own body processes and the things which happen when these go wrong. Twelve short chapters deal with simple physiology and rules for health, not only for the ordinary man but for the expectant mother, the baby, the growing child, the middle-aged, the old, and those who must live in the tropics. Two first-class sections cover home nursing and the proper contents of the household medicine cupboard. In the second part of the book common ailments are arranged alphabetically and their nature is described clearly. The anonymous author has the gift of seeing the wood through the trees, and he reduces complicated diseases to simple but accurate terms in the space of a few lines. His views on child management strike a slightly out-of-date note in an otherwise modern setting: it is a pity, for example, to find mechanical restraint, however mild, recommended for masturbation, or the phrase "Ladies don't do that" still admitted to nursery vocabulary. The section on poisoning is a little masterpiece of compression and tabulation: generalities first, exceptions second, individual cases third.

MENTAL TREATMENT IN IRELAND

PAST and present facilities for mental treatment in Ireland—and the lack of them—were discussed by the section of medicine of the Royal Academy of Medicine in Ireland at its meeting on Feb. 24. The first modern mental hospital in the country, said Dr. Francis Pilkington, was St. Patrick's in Dublin, founded by Dean Swift in 1745. In the next 150 years there was great activity in the building of hospitals but accommodation always fell behind needs, and many of the insane remained under indifferent conditions in the workhouses. Dr. J. Dunne deplored the fact that legislation in Eire in the last forty years had fallen so far short of that elsewhere, especially in catering for voluntary patients. He urged the need for child-guidance clinics, for at present, he said, there was no provision for the backward child, the "problem" child or the psychotic child. Dr. H. Lee Parker thought that the essential difficulty in Ireland was the lack of method in taking care of psychoneurotic and borderline cases. He suggested that patients should first go to a general hospital to exclude the presence of physical disease, and that there should be clinics to which they could then be referred as voluntary patients. These should be under the control of the state mental hospitals, but, in deference to popular prejudice, should be in separate buildings and should have a name which conveyed no idea of insanity. Here patients would be examined and treated or, if they turned out to be certifiable, sent

5. Buckley, T. E., and Harvie-Brown, J. A., A Vertebrate Fauna of the Orkney Islands, 1891, p. 243.
6. Walpole-Bond, J., *Country-Side*, 1907, 6, 69.
7. Haagen, von E., and Mauer, G., *Dtsch. med. Wschr.* Jan. 6, 1939, p. 13.

1. The Household Doctor. London: The English Universities Press. 1938. Pp. 216. 2*s*.

on to a mental hospital. He considered it a crime that the insane, the epileptic and the feeble-minded should all be housed under one roof.

Dr. W. R. F. Collis divided children for whom accommodation should be provided by the state into four groups: (1) mental defectives, such as mongols; (2) difficult children, for whom child-guidance clinics were an urgent necessity; (3) actual psychotic children; and (4) epileptics, who were the curse of the outpatient departments of all children's hospitals, and became more and more difficult to deal with as they got older. The need for psychology clinics for borderline cases separate from the ordinary mental hospitals was again urged by Dr. J. C. Flood, who said that for the next half century anything in the nature of mental disease would carry a definite stigma in Ireland. He was satisfied with the training in mental disease that students now received, for he thought that every student at qualification was capable of recognising a case of certifiable disease and of determining when certification should be carried out. Dr. Leonard Abrahamson, the president, thought that students should be taught enough psychology to enable them to assess their patients from this standpoint. In reply to a question from Dr. H. J. Eustace as to the value of temporary certification, Dr. Pilkington said that this was being used to an increasing extent in England, but it had the drawback of being more complicated than ordinary certification, and seeing that comparatively few patients were strictly non-delusional, it had only a limited applicability. Child-guidance clinics, he said, were very expensive to run, but he suggested that there should be an outpatient psychology clinic in every hospital for both children and adults, and that each clinic should have a few beds available for use when required.

FILARIAL BLINDING IN EAST AND CENTRAL AFRICA

ABOUT a year ago Dr. Adams of the Liverpool School of Tropical Medicine reported [1] a case of filarial blinding in a male European, who had lived in the Belgian Congo and in Tanganyika and Kenya Colony. He had probably been infested with the *Onchocerca volvulus* in one of these countries. Larvæ of the parasite were found in the skin and the bulbar conjunctiva, and, by slit-lamp examination, active microfilariæ were seen in the aqueous. The blood showed a 40 per cent. eosinophilia. A note on this report in the *East African Medical Journal* called attention to the possibility of cases occurring in Kenya and other territories. An inquiry was then set on foot and the reports from the various countries together with relevant information from the Sudan and the Belgian Congo have now been brought together in a symposium.[2]

The *Onchocerca volvulus* is conveyed to the human subject by *Simulium damnosum* and *S. neavei*. These biting flies have always been found in areas where onchocerciasis is prevalent. Their habits have been intensively investigated by Mr. Gibbins of the Uganda service, who contributes a valuable article to the symposium. *S. damnosum* is only found in well-aerated rocky gorges along rapid streams. The distribution of onchocerciasis is, therefore, remarkably limited.

First recognised on the West Coast in 1893, the earliest record of onchocerciasis in Central Africa is that of Sir Albert Cook, who found the parasite in tumours removed from natives of Busoga, in Uganda, as long ago as 1899. The filaria develops slowly. Several years may pass before there are manifestations of its presence. The adults produce subcutaneous tumours varying in size from a pea to a pigeon's egg. They closely resemble fibromata or sebaceous cysts. They do not suppurate and may persist for thirty years. As a rule they are few in number, though Prof. R. P. Strong of Harvard and his colleagues, working in a highly infested district in the Belgian Congo, found patients with as many as 150 small tumours. The adult worms breed in these tumours and microscopical examination of them shows cross-sections of adult onchocerca, of ova containing larvæ and of masses of larvæ lying free in the cavities (Burke-Gaffney). In addition to the tumours caused by the adult worms, the microfilariæ cause an intensely irritating polymorphic skin eruption and the parasites are easily demonstrated in scrapings of the integument.

That the eye may be attacked by the parasite was first recognised by Pacheco Luna in Guatemala in 1918, and Dr. E. Brumpt was led to name the local parasite *Onchocerca cæcutiens*, though it is now believed that this is not a different species. It has been suggested that the height of the vegetation may render the head more likely to be attacked by the fly in certain districts. It is generally recognised that where there are tumours on the head ocular onchocerciasis is more likely to occur.

The earliest account of filarial blinding in East Africa was given by Mr. F. W. Dry, assistant entomologist in Kenya in 1921. He described the skin affection investigated later by Gibbins and Loewenthal (1933), but he made the important observation that the tribesmen attributed blindness and impaired vision to the biting of flies, which proved to be *Simulium damnosum*.

For several years the medical officers of the Anglo-Egyptian Sudan have studied the condition known as Sudan blindness which occurs in certain parts of the Bahr-el-Ghazal. They found two types of ocular onchocerciasis. The more serious is a retino-choroiditis which goes on to optic atrophy. It is very rapid in its development, blindness occurring in from two to five months after the initial lacrimation and night-blindness. This affection is usually bilateral. The other, and more common, disease is a keratitis associated with iridocyclitis, which may also lead to grave impairment of vision. Microfilariæ can often be obtained from the aqueous, and slit-lamp examination shows the parasites crossing the field of vision. In 1935 Dr. A. J. Boase of the Uganda service reported the case of a Muganda school-teacher who was blind in one eye from optic atrophy. Dr. Boase was fortunate enough to see with the slit-lamp microfilariæ crossing the aqueous in the apparently sound eye. Prof. Strong, in conducting his intensive investigation of a highly infested area in the Belgian Congo with the assistance of Dr. Jean Hissette and others, found a high percentage of cases of filarial blinding. Dr. Hissette gave an admirable account of the ocular manifestations illustrated in colour.[3]

The reports collected show that there is evidence of the presence of ocular onchocerciasis in several East African territories, but in many cases of blindness this cause has not been recognised.

One of the most important features of the symposium in the *East African Medical Journal* is Dr. R. J. Harley-Mason's report of three cases of filarial blinding in Europeans in Kenya. All these men had been working in a particular district in the colony. In this area Dr. E. W. C. Jobson had a case of onchocercal tumour in an African and a further investigation by Dr. F. Hawking, senior research fellow of the Medical Research Council, showed that onchocerciasis of the skin was present in a high proportion of the natives of the district. Further inquiry is being made as to the incidence of ocular manifestations. Dr. Harley-Mason, who is an ophthalmologist in the Kenya service, suggests that a routine investigation of the blood for eosinophilia should be made in all cases of chronic conjunctivitis occurring in persons who have lived in the tropics. He found an eosinophilia of 17 to 23 per cent. in his cases. Mr. Gibbins, who has studied the habits of the simulidæ in Uganda, holds that it will be extremely difficult to deal satisfactorily with the fly vector of

1. Adams, A. R. D., *Lancet*, 1938, **1**, 545.
2. *E. Afr. med. J.* February, 1939, p. 361.
3. *Amer. J. trop. Med.* (Supplement), January, 1938.

onchocerciasis. The Sudan authorities believe that other flies may also be carriers of the filaria. It is said that removal of tumours near the eye has a beneficial effect on the ocular affections. Antimony and other chemotherapeutic remedies have been administered with only partial improvement. Advanced cases where there is cicatricial change are, of course, unaffected.

PSYCHOLOGICAL FACTORS IN RHEUMATIC DISORDERS

Sir Leonard Hill, F.R.S., took the chair last week at one of the lecture-discussions on rheumatic disorders being held at the St. John Clinic and Institute of Physical Medicine, London. Dr. Philip Ellman said that clinicians were often struck by the importance of emotional factors in determining, in particular, the response to treatment of patients with arthritic disorders, and it was this which had led Dr. Mitchell and himself, in 1932, to make some relevant investigations.—Dr. S. D. Mitchell said that a psychiatric study of the personalities of two groups of 40 patients with rheumatoid and osteo-arthritis showed, particularly in the first group, an excess of patients of a personality type characterised by depressive features, by morbid anxiety and by mild ideas of reference. He had been impressed by the frequency of emotional disturbance within one month of the onset of arthritic conditions. Such disturbances might easily act as precipitating factors.—Dr. A. T. M. Wilson said it was increasingly recognised that the adjective "organic" referred to a secondary phase of disease which followed on primary disturbances which were purely physiological. Summarising some preliminary observations made by Dr. Eric Wittkower and himself, he pointed out that experimentally produced emotional states could be shown to affect the metabolic level, the extent of allergic reactions, the development of immunity, the endocrine situation, and the vasomotor and muscular tone. All these had been described as important factors in rheumatic disorders. After discussing investigations reported by various workers, he described briefly a few cases where "fibrositis," although it probably had a local origin in vasomotor and spastic conditions of muscle, was almost certainly part of a psychoneurotic reaction to some gross environmental disturbance. This finding was borne out by the statement which had been made that only in countries with state health insurance does the total incapacity produced by "rheumatism" exceed that arising from tuberculosis.

SUBJECTIVE EXPERIENCE OF A CEREBRAL TUMOUR

WHEN a practised imaginative writer who has had a tumour removed from his brain sets out to describe what happened it is inevitable that the account [1] will seem highly coloured to the medical reader, who would indeed be foolish to look in it for an objective case-book record. Frigyes Karinthy, conscious of his professional temptations, was scrupulous to put down what he remembered in a sober undistorted way, and his book may be taken as a fair description of how our neurosurgical procedures can affect a very intelligent egotistical artist. It is also, of course, a first-hand account of the actual experience of discovering oneself to have a cerebral tumour, with all the attendant emotions of dread, uncertainty, detachment and resignation. The tumour was subtentorial, and apparently angiomatous. Its removal was carried out by Prof. Olivecrona of Stockholm, after preliminary examination had been made in Vienna by Prof. Pötzl and in Budapest by various specialists. The author describes in much detail the clinics and the doctors who were concerned, but occasionally one doubts the accuracy of his memory: it seems hardly likely, for example, that the Budapest ophthalmologist who found his papilloedema to be increasing rapidly would have warned him that if the tumour were not removed he would become not only blind but a fortnight later completely paralysed, and "then idiocy" (p. 143). This may have been one of the points at which "the writer in me sometimes entertains an arrogant belief that he could improve upon the truth by a little deliberate artifice" as he candidly tells us, though he goes on to say that he did not yield to such inclinations. In any case, this is a highly personal document, a remarkable and vivid piece of curious autobiography.

1. A Journey round my Skull. By Frigyes Karinthy. Translated from the Hungarian by Vernon Duckworth Barker. London: Faber and Faber. 1939. Pp. 288. 8s. 6d.

INDEX TO RADIOLOGY.—The American Roentgen Ray Society has published an index [1] of publications from 1903 to 1937 covering both its *Transactions*, which appeared from 1903 to 1908, and the 38 volumes of its journal. This appeared first as the *American Quarterly of Roentgenology*, later as the *American Journal of Roentgenology*, and since 1923 under its present title of the *American Journal of Roentgenology and Radium Therapy*. In the authors index there are 22,500 entries, and in the subject index 160,000. Together they give a comprehensive review of the beginnings and growth of radiology and radiotherapy. The index has been compiled by Dr. George H. Smith, and workers in this field will be grateful to him.

Dr. C. C. FENWICK writes: I must disclaim any share in the compilation of the otherwise excellent article in your issue of March 25 on the treatment of postencephalitic parkinsonism. From the opening paragraph it might seem that the Law nursing home was indebted to me for some assistance in this question, whereas it is in fact only to Herr Siewald that the indebtedness lies.

Messrs. ELI LILLY inform us that the address of their head office, to which all communications should be sent, is now Eli Lilly and Co., Ltd., Basingstoke, Hants. The London office remains available for information.

1. Consolidated Indices, Author and Subject: 1903–1937. Springfield, Illinois: Charles C. Thomas. 1939. Pp. 451. $13.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 18, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1739; diphtheria, 972; enteric fever, 10 (22 "expected"); pneumonia (primary or influenzal), 1205; puerperal pyrexia, 173; cerebrospinal fever, 36; acute poliomyelitis, 2; encephalitis lethargica, 3; dysentery, 28; ophthalmia neonatorum, 88. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 24 was 3292, which included: Scarlet fever, 672; diphtheria, 715 (carriers, 48); measles, 9; whooping-cough, 880; puerperal fever, 10 mothers (plus 4 babies); encephalitis lethargica, 300; poliomyelitis, 2. At St. Margaret's Hospital there were 25 babies (plus 15 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from smallpox, 2 (0) from enteric fever, 7 (2) from measles, 1 (0) from scarlet fever, 24 (4) from whooping-cough, 27 (0) from diphtheria, 54 (13) from diarrhœa and enteritis under two years, and 176 (42) from influenza. The figures in parentheses are those for London itself.

The number of deaths attributed to influenza has again fallen, the totals for this week and the eleven preceding weeks (working backwards) being 176, 261, 284, 285, 255, 265, 210, 173, 223, 214, 144, 89. Of these 176 deaths West Ham reported 8, Bournemouth, Luton, and Birmingham each 6, and no other great town more than 4. Fatal cases of diphtheria were scattered over 18 great towns, Liverpool reporting 5. There were 3 deaths from whooping-cough at Manchester, and 8 from diarrhœa and enteritis under two years at Birmingham.

The number of stillbirths notified during the week was 238 (corresponding to a rate of 38 per 1000 total births), including 34 in London.